THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

FINAL

2025 Part 1: Regional Context



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JUNE 2026

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THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Standard Limitations and Disclaimer

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Acronyms and Abbreviations

Acronym	Definition
AB1668	Assembly Bill 1668
AF	Acre-feet
AFY	acre-feet per year
APA	Allowed Pumping Allocation
AWUR	Annual Water Use Report
AWWA	American Water Works Association
BPOU	Baldwin Park Operable Unit
CEC	Contaminants of Emerging Concern
cfs	cubic feet per second
CIC	Covina Irrigating Company
CIMIS	California Irrigation Management Information System
CRA	Colorado River Aqueduct
CVWC	Covina Valley Water Company
CWC	California Water Code
DAC	disadvantaged community
DDW	Division of Drinking Water
DBP	Disinfection Byproduct
DCP	Drought Contingency Plan
DCR	Delivery Capability Report
DMM	demand management measure
DRA	Drought Risk Assessment
DVL	Diamond Valley Lake
DWR	California Department of Water Resources
DYYP	Dry-Year Yield Program
ET	evapotranspiration
ETo	reference evapotranspiration
FY	Fiscal year
GAC	Granular Activated Carbon
GAMA	Groundwater Ambient Monitoring and Assessment Program
GHG	greenhouse gas
GIS	geographic information systems
GMP	Groundwater Management Plan
GPCD	gallons per capita per day
gpmd	gallons per mile of pipe per day
gpscd	gallons per service connection per day
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
IEUA	Inland Empire Utilities Agency
JWL	Joint Water Line

Acronym	Definition
LACSD	Los Angeles County Sanitation Districts
LACDPW	Los Angeles County Department of Public Works
LDX	Local Data Exchange
LRP	Local Resources Program
MAF	million acre-feet
MCL	Maximum Contaminant Level
MHI	Median Household Income
MGD	million gallons per day
mg/L	milligrams per liter
MWD	Metropolitan Water District of Southern California
MWTP	Miramar Water Treatment Plant
NTU	Nephelometric Turbidity Unit
OBMP	Optimum Basin Management Program
OSY	Operating Safe Yield
PBWA	Puente Basin Water Agency
PCE	Tetrachloroethene
PFAS	Per- and polyfluoroalkyl substances
PVPA	Pomona Valley Protective Association
RHNA	Regional Housing Needs Assessment
RO	reverse osmosis
RUWMP	Regional Urban Water Management Plan
SB1157	Senate Bill 1157
SB606	Senate Bill 606
SCAG	Southern California Association of Governments
SGMA	Sustainable Groundwater Management Act
SJCWRP	San Jose Creek Water Reclamation Plant
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAZs	traffic analysis zones
TCE	Trichloroethene
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TCP	1,2,3-Trichloropropane
TVMWD	Three Valleys Municipal Water District
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
VHWC	Valencia Heights Water Company
VIC	Variable Infiltration Capacity
VOC	Volatile Organic Compounds
WUEData	Water Use Efficiency Data

Acronym	Definition
WRD	Water Replenishment District of Southern California
WRMP	Water Resources Master Plan
WRP	water reclamation plant
WSCP	Water Shortage Contingency Plan

Executive Summary

E.S.1. Purpose of the Plan

The 2025 Regional Urban Water Management Plan (RUWMP or Plan) provides a long-range assessment of water supply reliability for the Three Valleys Municipal Water District (TVMWD) service area and its participating retail agencies through the year 2050. The Plan is prepared in accordance with the California Urban Water Management Planning Act and the 2025 UWMP Guidebook issued by the California Department of Water Resources (DWR) (DWR, 2026a). To satisfy the requirements of California Water Code Section 10630.5, this Executive Summary also serves as the statutory "Lay Description" of the Region's water supply reliability. The analytical framework, assumptions, and findings described in this lay description apply to all participating urban water suppliers included in this RUWMP. Individual UWMPs prepared as part of this regional effort rely on this description to satisfy the lay description requirement of the Urban Water Management Planning Act.

This RUWMP serves two primary purposes:

1. To clearly demonstrate that the Region has adequate and reliable water supplies to meet existing and projected future demands under normal conditions and during droughts; and
2. To provide a coordinated regional planning framework that improves consistency, reduces duplication, and strengthens individual UWMPs prepared by participating retail agencies.

By planning together at a regional scale, the agencies are better positioned to manage shared imported water systems and groundwater basins, respond to climate change, and maintain reliable water service for residents, businesses, and institutions.

E.S.2. Agencies Included in the RUWMP

This RUWMP was led by TVMWD in collaboration with seven retail water agencies (collectively referred to as the Participating Agencies):

- City of Glendora
- City of La Verne
- City of Pomona
- Golden State Water Company – Claremont System
- Golden State Water Company – San Dimas System
- Rowland Water District
- Walnut Valley Water District

In addition, the regional analysis incorporates water demand and supply estimates for other water agencies operating within the TVMWD service area. These include the Boy Scouts of America - Firestone Reservation, California Polytechnic University Pomona (Cal Poly Pomona), the City of Covina, Mt. San

Antonio College (Mt. SAC), Suburban Water Systems, and Valencia Heights Water Company. While these agencies prepared their own independent UWMPs, their water use affects shared regional supplies. Including them ensures that the regional water reliability analysis reflects total system conditions, rather than only participating agencies.

E.S.3. Regional Setting

The TVMWD service area (Region) covers approximately 133 square miles in southeastern Los Angeles County, extending from the foothills of the San Gabriel Mountains south to the Puente Hills and east toward the San Bernardino County line. The Region includes the Pomona Valley, Walnut Valley, and portions of the eastern San Gabriel Valley. The service area is predominantly urban with residential neighborhoods, commercial and industrial areas, educational institutions, and public facilities and is home to approximately 516,000 people as of the 2020 Census.

E.S.4. Population and Water Demand Projections

Population growth within the Region is expected to be modest through 2050, with most growth occurring through redevelopment and infill. Water demand projections account for anticipated population changes, employment trends, and land use patterns, as well as the effects of mandatory water conservation requirements.

Projected demands reflect ongoing and future reductions in per capita water use resulting from implementation of State mandated water use efficiency regulations, including the “Making Conservation a California Way of Life” requirements. These conservation measures are expected to partially offset demand increases associated with population growth and climate change.

E.S.5. Regional Water Supply Portfolio

The Region relies on a diversified water supply portfolio, which provides flexibility and resilience during dry conditions. Based on recent historical conditions (2021–2025), the regional water supply consists of:

- **Imported Water (~50%)**
  Water purchased from the Metropolitan Water District of Southern California (MWD), originating from the State Water Project (SWP) and the Colorado River, forms the backbone of the Region’s supply. MWD’s extensive surface and groundwater storage system provides a high level of drought reliability.
- **Local Groundwater (~44%)**
  Groundwater is produced from six basins: the Main San Gabriel Basin, Chino Basin, Six Basins, Spadra Basin, Central Basin, and Puente Basin. These basins are managed through court adjudications or Groundwater Sustainability Plans (GSPs) that protect long-term yields.
- **Recycled Water (~4%)**
  Several agencies use recycled water for non-potable purposes such as landscape irrigation, which reduces demand for potable supplies.

- **Local Surface Water (~2%)**
  Limited amounts of surface water are diverted from the San Gabriel River and San Antonio Creek, primarily during wet periods.

Together, these supplies support a robust conjunctive use strategy that includes storing imported water in local groundwater basins during wet years and withdrawing stored water during dry years.

E.S.6. Water Supply Reliability and Drought Planning

This RUWMP evaluates water supply reliability under multiple scenarios, including normal hydrologic conditions, a single dry year, and a five consecutive year drought. The analysis incorporates climate change considerations, including increased temperatures and changes in precipitation patterns.

The results of the reliability analysis demonstrate that sufficient supplies are projected to be available to meet regional water demands through 2050 under all evaluated scenarios. Short-term or localized reductions in groundwater or local surface water are assumed to be offset by imported water supplies from TVMWD and MWD, which are projected to remain fully reliable through the planning horizon. Regional groundwater storage, access to imported water supplies, and coordinated drought response planning provide the necessary flexibility to manage extended dry periods.

Each Participating Agency maintains its own Water Shortage Contingency Plan (WSCP), which outlines actions to be taken during water shortages and drought conditions.

E.S.7. Threats to Local Supply Reliability

While the Region's water portfolio is highly reliable under modeled scenarios, TVMWD and the Participating Agencies face operational threats that require proactive management. These threats primarily impact the physical ability to access and utilize local water supplies:

- **Climate Volatility**
  As identified in the Region's 2024 Climate Change Vulnerability Assessment, rising temperatures and shifting hydrologic patterns threaten both supply and demand. The Region is projected to experience shorter, flashier rainy seasons characterized by high-intensity storm events. This volatility poses a direct challenge to local spreading grounds, as heavy storm flows can exceed the immediate capture capacity of diversion facilities, resulting in lost groundwater recharge. Concurrently, hotter baseline temperatures are expected to drive up evapotranspiration and outdoor water demands.
- **Groundwater Quality and “Stranded Assets”**
  Decades of historical land-use practices have introduced contaminants – including Volatile Organic Compounds (VOCs), nitrates, and perchlorate – into the Region’s underlying aquifers. Furthermore, the Region faces a threat from moving regulatory targets, specifically the introduction of ultra-low Maximum Contaminant Levels (MCLs) for Per- and Polyfluoroalkyl Substances (PFAS). When wells exceed these strict new safety standards, they must be taken offline. These "stranded assets" temporarily eliminate local extraction capacity, forcing agencies to rely more heavily on imported water when the Region is working to reduce that dependence.

E.S.8. Planned Capital Projects

To proactively mitigate these climate and regulatory vulnerabilities, TVMWD and its Participating Agencies have identified a suite of collaborative water supply projects. These regional partnerships focus on optimizing existing infrastructure, remediating stranded groundwater assets, expanding conjunctive use, and maximizing the capture of local supplies. Key planned regional projects include:

- **Restoring Stranded Assets (GRIP+)**
  A major regional partnership between TVMWD, the City of Glendora, and the City of Pomona to install new extraction wells and advanced wellhead treatment systems. By treating contaminated groundwater, this project will restore local extraction capacity and produce approximately 9,200 acre-feet per year (AFY) of highly reliable local supply from the Main San Gabriel Basin.
- **Advanced Recycled Water Storage (Spadra Basin Optimization)**
  A collaborative initiative spearheaded by Walnut Valley Water District, the City of Pomona, and Cal Poly Pomona. This project proposes injecting advanced treated recycled water into the Spadra Basin via new injection wells, creating a drought-resilient local storage asset with a capacity of up to 3,500 acre-feet (AF).
- **Conjunctive Use Exchanges (Chino Basin)**
  Building upon existing successful dry-year yield programs, TVMWD and Pomona are evaluating an "in-lieu" exchange program. TVMWD would fund extraction and treatment upgrades in the Chino Basin in exchange for Pomona pumping and conveying an equivalent amount of local water to other TVMWD member agencies during droughts.
- **Stormwater Capture Enhancements**
  To address the shift toward shorter, higher-intensity winter storms, the Region is working with local flood control districts and protective associations to excavate deeper recharge basins (such as the San Antonio Spreading Grounds) and upgrade diversion structures. This will increase the instantaneous capture and storage volume of flash-flood runoff.
- **External Partnerships and Interties**
  The Region is actively pursuing new pipeline interties, such as a partnership through the Puente Basin Water Agency with the Covina Valley Water Company. This will allow the physical importation of up to 2,000 AFY of surplus local water eastward, directly offsetting reliance on imported water deliveries.

E.S.9. Water Conservation and Water Use Efficiency

Water conservation and water use efficiency are core components of the Region’s water management strategy. Retail agencies have implemented a wide range of conservation programs, including public education, rebate programs, landscape efficiency improvements, leak detection, and tiered water pricing.

All Participating Agencies previously met the State’s 2020 water conservation targets and continue to align with new efficiency standards established by State legislation and regulations. These efforts reduce long-term demand and improve overall system reliability.

E.S.10. Regional Coordination

This RUWMP was developed through a coordinated regional planning process involving TVMWD and Participating Agencies. Regional planning allows for consistent assumptions regarding shared water supplies, reduces duplication of effort, and strengthens the technical foundation of individual agency UWMPs.

Public participation was incorporated through notices, public meetings, and hearings conducted by the Participating Agencies prior to adoption of the Plan. TVMWD also conducted regional workshops with the stakeholders in the Region to provide an update on the development of the RUWMP.

E.S.11. Conclusion

This RUWMP demonstrates that the TVMWD region has adequate and reliable water supplies to meet projected demands through 2050, even under extended drought conditions. Long-term water demands are expected to decline due to conservation regulations, despite modest population growth.

Through continued use of diversified water supplies, conservation, regional coordination, and proactive planning, the Region is well positioned to adapt to future challenges, including climate change and regulatory requirements, while maintaining reliable water service for residents and businesses. Furthermore, continued investment in groundwater quality treatment is critical to protecting local water supplies. Regional coordination improves planning consistency and strengthens individual agency UWMPs.

E.S.12. Use of This Plan

This RUWMP serves as the regional technical foundation for each Participating Agency's individual Urban Water Management Plan (UWMP). Each agency adopts the portions of the Plan relevant to its service area while maintaining authority over local operations, conservation programs, and water shortage response actions.

Taken together, the Regional Context (**Part 1**) and Individual Agency UWMP chapters (Part 2) along with the Regional Supporting Information (**Part 3**) and Agency Supporting Information (Part 4) provide a comprehensive, coordinated strategy to ensure safe, reliable, and sustainable water service for the Three Valleys region.

1. Introduction

Three Valleys Municipal Water District (TVMWD) and its partnering agencies have long demonstrated a commitment to regional water resilience and sustainable resource management. As water supply reliability challenges continue to evolve across Southern California, TVMWD and its retail agencies recognize that water resources – specifically, imported water from the Metropolitan Water District of Southern California (MWD) and local groundwater basins – are regionally interdependent. To address these shared challenges and ensure consistent planning assumptions, TVMWD has led the development of this 2025 Regional Urban Water Management Plan (RUWMP or Plan) in collaboration with seven of its retail agencies.

The agencies participating in this 2025 RUWMP (Participating Agencies) include:

- Three Valleys Municipal Water District (Lead Agency)
- City of Glendora
- City of La Verne
- City of Pomona
- Golden State Water Company (GSWC) (Claremont System)
- GSWC (San Dimas System)
- Rowland Water District (Rowland WD)
- Walnut Valley Water District (WVWD)

In addition, there are two TVMWD retail agencies who have prepared independent 2025 UWMPs: the City of Covina and Suburban Water Systems. TVMWD has also coordinated with these agencies through development of this RUWMP and has incorporated their estimated supplies and demands into the regional analysis to provide a comprehensive analysis of regional water resources.

By coordinating as a Region[1], the Participating Agencies aim to reduce redundancy, improve consistency in supply and demand assumptions, and strengthen the technical foundation for each agency's individual planning efforts. This RUWMP presents a unified, regionally consistent analysis of water supply reliability, demand projections, and drought preparedness, providing a roadmap for the region to maintain reliable water service through 2050.

1.1. Background and Purpose

The California Water Code (CWC) requires urban water suppliers within the state to prepare and adopt Urban Water Management Plans (UWMPs) for submission to the California Department of Water Resources (DWR). The UWMPs, which are required to be filed every five years, must satisfy the requirements of the Urban Water Management Planning Act (UWMP Act) of 1983, including subsequent

[1] The Three Valleys Municipal Water District service area is referred to as the Region in the context of this RUWMP.

amendments. The UWMP Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually to prepare a UWMP.

A UWMP is intended to function as a long-term planning tool to guide broad-perspective decision-making by water suppliers. It is a general planning framework rather than an exact blueprint for supply and demand management. It generally answers a series of planning questions, including:

1. What are the potential sources of supply and what is the reasonable probable yield from them?
2. What is the probable demand, given a reasonable set of assumptions about growth and implementation of water use efficiency?
3. How well do supply and demand figures match up, assuming that the various probable supplies will be pursued?
4. How will the agency respond to drought conditions or water shortages?

This 2025 RUWMP satisfies all CWC requirements for the 2025 cycle, including updates to the UWMP Guidebook, published by DWR in December 2025; details regarding these updates are described in Chapter 1 of the DWR 2025 UWMP Guidebook (DWR, 2026a).

1.1.1. Regional Urban Water Management Plan

Water purveyors are permitted by DWR to work together to develop a cooperative regional UWMP. CWC Section 10620(d)(1) states: "An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use."

The purpose of jointly preparing this RUWMP is to facilitate a consistent evaluation of water sources common to the various agencies (specifically imported water from TVMWD and shared groundwater basins), to take advantage of group knowledge and experience, and to reduce preparation costs.

1.2. Plan Organization

This Plan is organized to meet the requirements of the UWMP Act for the eight Participating Agencies (TVMWD and seven retail agencies). Each Participating Agency has reviewed, adopted, and will implement the portions of this Plan relevant to their agency.

To streamline reporting and avoid redundant data entry, this Plan is organized into four distinct parts:

Part 1: Regional Context

Part 1 contains the information needed to meet the UWMP Act requirements that are common to all Participating Agencies. This section provides a comprehensive "roll-up" of the region’s water portfolio. It includes:

- Regional System Description: A description of the climate, demographics, and land use for the entire TVMWD service area.
- Water Sources: Detailed descriptions of the shared imported water supplies (from MWD) and the management of regional groundwater basins (Main San Gabriel, Chino, Six Basins, Spadra, Central, and Puente).
- Regional Reliability: An aggregation of supply and demand projections to assess water reliability for normal, single-dry, and five-year consecutive drought scenarios through 2050. Also includes a near-term stress test assessing the region's ability to meet demands during a drought over the next five years (2026–2030).

It should be noted that while the RUWMP is authored and adopted by the eight Participating Agencies listed above, the regional analysis in **Part 1** incorporates data from Other Member Agencies within the TVMWD service area (such as the City of Covina and Suburban Water Systems) to ensure the regional supply and demand assessment accurately reflects the total water use within the TVMWD service area.

Part 2: Individual Agency UWMPs

Part 2 includes a specific chapter for each of the Participating Agencies. Each chapter is supplemental to the regional information presented in **Part 1**. These chapters contain the agency-specific data required to meet the UWMP Act that cannot be reported regionally, including:

- Service area maps and climate characteristics.
- Descriptions of past and current water use.
- Future demand projection methodologies.
- Local water distribution system losses (water loss audit results).
- SB X7-7 and future water use objectives.
- Water supply entitlements or constraints unique to that retailer.
- Water Shortage Contingency Plan (WSCP) adoption and protocols.
- Demand management measures implemented by that retailer.
- RUWMP adoption.

Part 3: Regional Supporting Information

Part 3 includes all supporting documentation referenced in **Part 1** that is applicable to the region as a whole. This includes the DWR Regional UWMP Checklist (Appendix A), documentation of regional public notices and workshops, water supply agreements and legal documents, and the regional adoption resolution by the Lead Agency (TVMWD), which formally adopts both this Regional Context and TVMWD's specific wholesale UWMP components.

Part 4: Local Agency Supporting Information

Part 4 includes a set of supporting documentation for each retail Participating Agency, corresponding to their respective chapters in **Part 2**. Documents for each agency include:

- The DWR Retail UWMP Checklist verifying the agency has met UWMP Act requirements.
- Proof of agency-specific public hearing notices and adoption resolutions.
- The full text of the agency's WSCP.
- Completed DWR Submittal Tables specific to that agency.
- Water supply agreements specific to that agency.

Reporting Structure

This 2025 RUWMP utilizes a layered reporting approach to satisfy both regional and individual requirements. This structure ensures consistency across agency-specific chapters while maintaining the necessary granularity for individual agency compliance. Figure 1-1 illustrates the relationship between the Regional Context (**Part 1**) and the Local Agency UWMPs (**Part 2**). **Table 1-1** identifies the location of key UWMP data elements within this document.

Figure 1-1. Regional Context vs. Local Agency UWMPs Relationship

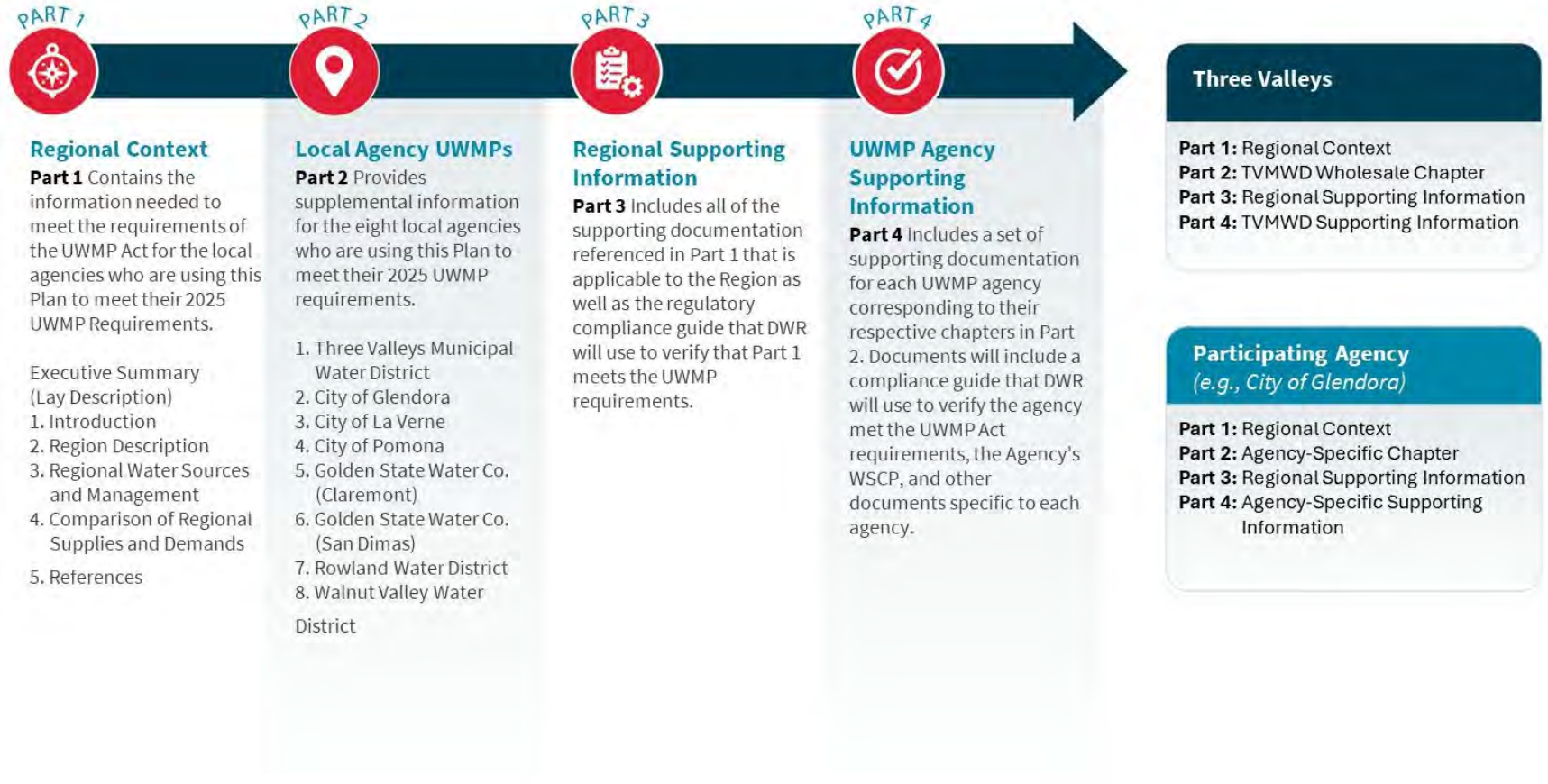


Table 1-1. Regional vs. Individual Reporting Matrix

UWMP Requirement	Part 1: Regional Context	Part 2: Individual Agency Chapters
System Description	Regional Climate and Demographics	Local Service Area Map and Customer Class Data
Water Use (Demand)	Aggregated Regional Demand Totals	Agency-Specific Demand Projections
SB X7-7 / AB 1668 Compliance	General Regional Trends	Specific Target Calculations and Compliance
Water Supply: Imported	MWD Reliability and Wholesale Allocation	Agency-Specific Purchase Projections
Water Supply: Groundwater	Basin Descriptions, Management, and Safe Yield	Agency-Specific Pumping Rights and History
Water Supply: Recycled	Regional Infrastructure and Opportunities	Agency-Specific Use and Projection
Water Supply Reliability	Regional Water Budget (Surplus/Deficit)	Agency-Specific Reliability Tables
Drought Risk Assessment (DRA)	Regional 5-Year Stress Test (2026-2030)	Agency-Specific 5-Year Stress Test
Water Shortage Contingency Plan	Regional Summary and Consistency	Full Agency WSCP Adoption and Protocols
Demand Management Measures	Regional Conservation Programs (TVMWD)	Local Conservation Programs
Adoption and Submittal	Regional Resolution (TVMWD)	Individual Resolutions (Retailers)

By utilizing this structure, the Participating Agencies ensure that the "Regional Context" serves as the substantiated technical foundation for the "Individual Agency UWMPs," resulting in a cohesive and defensible regional planning document.

1.3. Plan Preparation and Coordination

Management of water resources in the Three Valleys region takes place within a complex legal and institutional framework. Development of this RUWMP required comprehensive coordination involving the cooperation of many parties engaged in water management. TVMWD solicited public involvement in the planning process by presenting updates at scheduled workshops and Board meetings, as well as soliciting public comments on the draft RUWMP.

The successful development of this 2025 RUWMP required strong coordination between TVMWD, MWD, and its retail agencies. The planning process was structured to ensure clear communication, foster collaboration, and maintain transparency between all agencies and broader stakeholders.

1.3.1. Participating Agencies

The agencies participating in the development and adoption of this RUWMP are listed in Section 1 (Introduction). These eight agencies (TVMWD and seven retail agencies) actively collaborated to develop

the demand and supply projections, assess regional drought risk, and align water shortage communication protocols where feasible (though each agency retains its own independent WSCP).

In addition to the Participating Agencies, this RUWMP incorporates data from "Other Member Agencies" within the TVMWD service area. While these agencies are not co-authors or signatories to this specific RUWMP, their water demands draw from the same regional aqueducts and groundwater aquifers as the Participating Agencies; collectively, these agencies represent a significant portion of the region's total water demand. To accurately project whether the region can meet its needs through 2050, projections for these agencies were estimated based on publicly available data (such as Master Plans and previous UWMPs) and data provided to TVMWD as part of regular reporting and was incorporated into the regional analysis in **Part 1**.

These Other Member Agencies include:

- Boy Scouts of America - Firestone Reservation / City of Industry
- California Polytechnic University, Pomona
- City of Covina
- Mt. San Antonio College
- Suburban Water Systems
- Covina Valley Water Company

Among the Other Member Agencies, the City of Covina and Suburban Water Systems have prepared independent 2025 UWMPs, as mentioned in the Introduction.

1.3.2. Public Participation

The Participating Agencies encouraged public participation in the preparation of this Plan to ensure the public's comments were considered in decisions about water management in the region. In accordance with the UWMP Act, the Participating Agencies issued a Notice of Plan Preparation to cities and counties within the region at least 60 days prior to the public hearing (notices distributed between March 13 and March 27, 2026). This notice informed stakeholders that the 2025 RUWMP was being prepared and invited input. **Table 1-2** identifies the stakeholders notified of the 2025 RUWMP preparation.

Copies of these 60-day Notice of Preparation letters and the associated distribution lists are included in each Participating Agency's Public Outreach appendix (**Appendix [X]-2**) in **Part 4**.

Prior to adoption, each Participating Agency provided notice to the public through its website and published announcements of the public hearing in a local newspaper once per week for two consecutive weeks. Copies of the proofs of publication for these public hearings are included in each Participating Agency's Public Outreach appendix (**Appendix [X]-2**) in **Part 4**.

Table 1-2. Stakeholders Notified of the Preparation of the 2025 RUWMP (60-Day Notice)

Agency/City/County	Three Valleys Municipal Water District	City of Glendora	City of La Verne	City of Pomona	GSWC - Claremont	GSWC - San Dimas	Rowland Water District	Walnut Valley Water District
Building Industry Association	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Cal Poly Pomona	✓	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chino Basin Watermaster	✓	n/a	n/a	✓	n/a	n/a	n/a	n/a
City of Azusa	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
City of Claremont	✓	n/a	✓	✓	✓	n/a	n/a	n/a
City of Covina	✓	✓	n/a	n/a	n/a	✓	n/a	n/a
City of Diamond Bar	✓	n/a	n/a	n/a	n/a	n/a	✓	✓
City of Glendora	✓	✓	n/a	n/a	n/a	✓	n/a	n/a
City of Industry	✓	n/a	n/a	n/a	n/a	n/a	✓	✓
City of La Habra	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
City of La Puente	✓	n/a	n/a	n/a	n/a	n/a	✓	n/a
City of La Verne	✓	n/a	n/a	n/a	n/a	✓	n/a	n/a
sCity of Montclair	n/a	n/a	n/a	n/a	✓	n/a	n/a	n/a
City of Pomona	✓	n/a	✓	✓	✓	n/a	✓	n/a
City of San Dimas	n/a	n/a	✓	n/a	n/a	✓	n/a	n/a
City of Upland	n/a	n/a	n/a	✓	✓	n/a	n/a	n/a
City of Walnut	✓	n/a	n/a	n/a	n/a	✓	✓	✓
City of West Covina	n/a	n/a	n/a	n/a	n/a	n/a	✓	✓
City of Whittier	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Covina Valley Water Company	✓	✓	n/a	n/a	n/a	n/a	✓	n/a
Golden State Water Co.	✓	✓	✓	✓	n/a	n/a	n/a	n/a
Hacienda La Puente Unified School District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Inland Empire Utilities Agency	✓	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Agency/City/County	Three Valleys Municipal Water District	City of Glendora	City of La Verne	City of Pomona	GSWC - Claremont	GSWC - San Dimas	Rowland Water District	Walnut Valley Water District
La Habra Heights County Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
La Puente Valley County Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Los Angeles County	✓	✓	✓	✓	✓	✓	✓	✓
Main San Gabriel Basin Watermaster	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
Metropolitan Water District	✓	n/a	n/a	✓	n/a	n/a	n/a	n/a
Mt. San Antonio College	✓	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pico Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Rowland Unified School District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Rowland Water District	✓	n/a	n/a	✓	n/a	n/a	n/a	✓
Six Basins Watermaster	✓	n/a	n/a	✓	n/a	n/a	n/a	n/a
Suburban Water Systems	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
Sycamore Development Partners	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Three Valleys Municipal Water District	n/a	✓	✓	✓	n/a	n/a	✓	✓
Upper San Gabriel Valley Municipal Water District	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
Valley County Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Walnut Valley Water District	✓	n/a	n/a	✓	n/a	n/a	✓	n/a
Yorba Linda Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a

Note: n/a = not applicable.

1.3.3. Stakeholder Workshops

Participating Agencies collaborated in the development of the Plan through a series of individual meetings and regional workshops to update elements of the Plan and review and provide feedback on preliminary results.

Individual Agency Data Collection

The data collection effort began with individual meetings between TVMWD planning staff and each of the seven retail Participating Agencies. These meetings were aimed at gathering granular data – including production numbers, consumption logs, and water loss audits – from the previous five fiscal years (FYs) 2021-2025). Following the initial data analysis, follow-up meetings were held with each agency to "ground-truth" their draft demand and supply projections. This iterative process allowed each agency to verify that their draft projections accurately reflected their specific portfolios, development plans, and operational constraints.

Regional Workshops

TVMWD hosted two regional workshops to facilitate data sharing and consensus among the agencies.

- Workshop 1 (January 29, 2026): The first workshop brought together Participating Agencies and other non-participating agencies to review the 2025 RUWMP structure, confirm the regional supply and demand projections, and review the results of the DRA. The meeting agenda, sign-in sheets, and presentation materials for this workshop are included in **Part 3, Appendix E**.
- Workshop 2 (April 2, 2026): A second workshop was held to review the Draft RUWMP and individual agency chapters prior to public release. This workshop focused on ensuring consistency across the agency-specific chapters (**Part 2**) and the regional roll-up (**Part 1**). The meeting agenda, sign-in sheets, and presentation materials for this workshop are included in **Part 3, Appendix E**.

1.4. Plan Adoption

The CWC requires that the UWMP be adopted by the governing body of each Participating Agency. Before the Plan could be adopted, the agencies were required to notify the public and hold a public hearing to encourage community input.

Adoption Strategy (Part 1 vs. Part 2)

To ensure that each Participating Agency meets its individual regulatory obligations while benefiting from a coordinated regional approach, this RUWMP was structured to allow agencies to adopt the specific components relevant to their service area.

- Three Valleys Municipal Water District (Lead Agency): Adopted **Part 1 (Regional Context)**, **Part 3 (Regional Supporting Information)**, and its specific wholesale agency chapter in **Part 2**.

- Retail Participating Agencies: Adopted **Part 1**, **Part 3**, and their respective individual agency chapter in **Part 2** and local appendices in **Part 4**.

This structure ensures that the "Regional Context" (**Part 1**) serves as a common foundation for the Participating Agencies, while the "Individual Agency UWMPs" (**Part 2**) remain the specific responsibility of each local governing body.

Public Hearing and Resolution

Following the public noticing period described in **Section 1.3**, each Participating Agency held a public hearing to discuss the 2025 RUWMP and the WSCP. The hearings provided an opportunity for the public to comment on the agencies' water management strategies.

Following the public hearing, each agency's governing body adopted the 2025 RUWMP and the 2025 WSCP via resolution. **Table 1-3** summarizes the adoption dates for each Participating Agency. Copies of the signed resolutions are included in **Part 3, Appendix F** (for the TVMWD Lead Agency resolution) and **Part 4**.

Table 1-3. Participating Agency RUWMP Adoption Dates and Resolutions

Agency	Public Hearing and Adoption Meeting
TVMWD	June 3, 2026
City of Glendora	June 9, 2026
City of La Verne	May 18, 2026
City of Pomona	May 18, 2026
GSWC (Claremont)	May 26, 2026
GSWC (San Dimas)	May 26, 2026
Rowland Water District	May 19, 2026
Walnut Valley Water District	May 18, 2026

Plan Submittal

In accordance with the UWMP Act, the Final 2025 RUWMP and WSCPs were submitted to DWR within 30 days of adoption and by the statutory deadline of July 1, 2026. The submittal was completed electronically using the DWR Water Use Efficiency Data (WUEdata) online portal.

Additionally, copies of the adopted Plan were submitted to the California State Library and the cities and counties within the region within 30 days of adoption. Transmittal receipts and letters are provided in **Part 3, Appendix G**.

Amending the Plan

If the adopted 2025 RUWMP or WSCP requires amendment in the future, the agency proposing the amendment will follow the same procedures for notification, public hearing, adoption, and submittal as were used for the original Plan, in accordance with the CWC.

2. Region Description

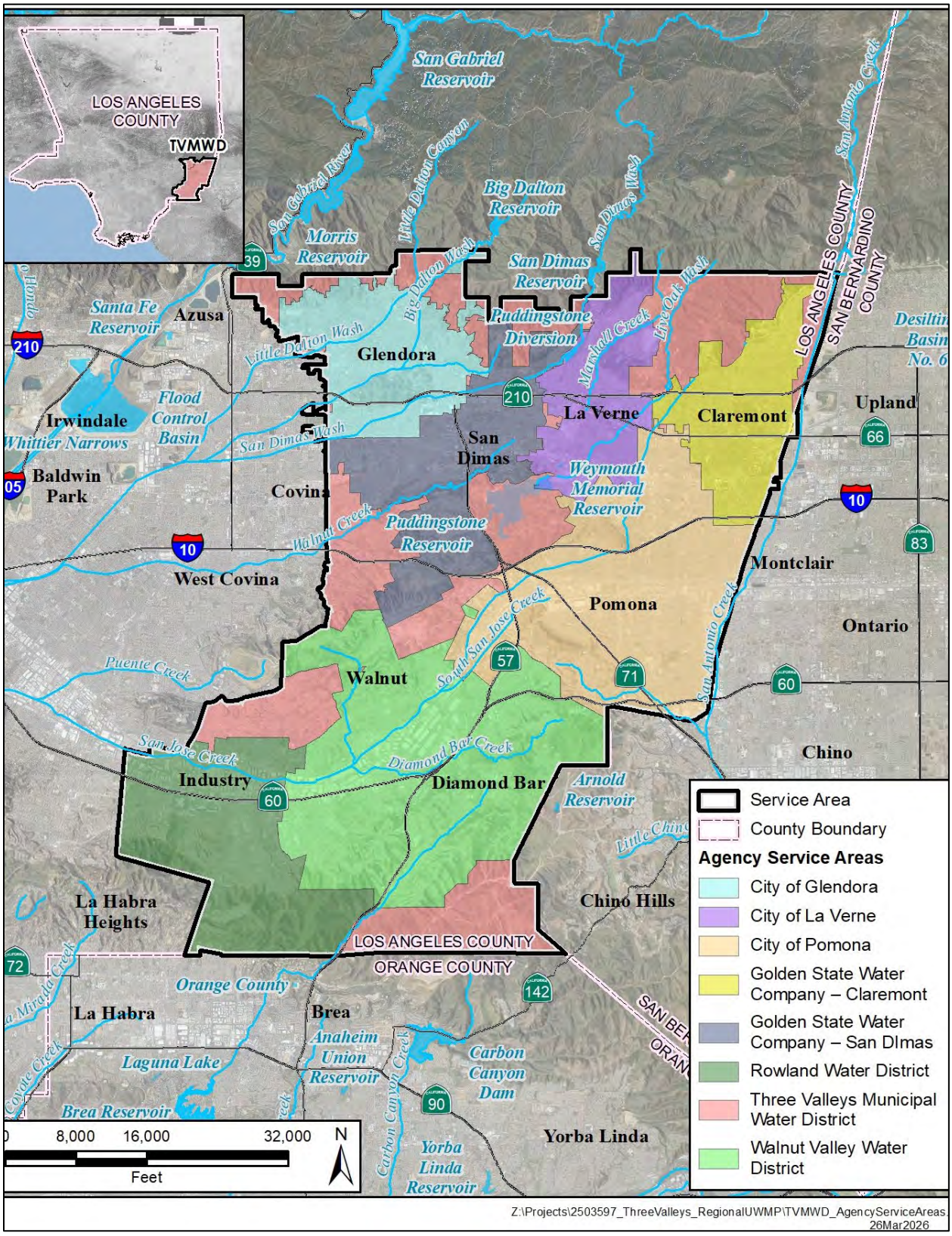
The Three Valleys Municipal Water District service area (Region) is located in the southeastern portion of Los Angeles County and covers a diverse landscape ranging from the foothills of the San Gabriel Mountains to the urbanized valley floors. This chapter describes the Region's characteristics, including its physical setting, population demographics, land use, and regional climate.

This chapter also identifies the local agencies and water suppliers that have a role in managing water resources within the Region. These agencies work collaboratively to manage a complex portfolio of imported water, local groundwater, and local surface water to support a thriving regional economy and population. A detailed discussion of the water resources managed within the Region is provided in Chapter 3 (Regional Water Sources and Management).

2.1. Regional Setting

The Region is defined by the service area of TVMWD, which encompasses approximately 133 square miles. The Region derives its name from the three primary valleys that make up its service area: the Pomona Valley, the Walnut Valley, and the eastern portion of the San Gabriel Valley. **Figure 2-1** summarizes this Region and its surrounding area.

Figure 2-1. Map of TVMWD Service Area



Geographically, the Region is bordered by the San Gabriel Mountains to the north, which provide a critical watershed for local surface flows and spreading grounds. To the east, the Region is bounded by the San Bernardino County line; to the south, by the Puente Hills and Orange County line; and to the west, by the San Gabriel River and the main San Gabriel Valley urbanized corridor.

The topography of the Region varies significantly, ranging from rugged foothill terrain in the north (Claremont, Glendora, La Verne) to the gently sloping valley floors where the majority of the residential and commercial development is located. This variation in terrain influences the Region's water management strategies, particularly regarding groundwater recharge capability and pressure zone management for water distribution.

The Region is a highly urbanized to semi-urbanized area that serves as a transition zone between the greater Los Angeles metropolitan area and the Inland Empire. It is traversed by major transportation corridors, including Interstates 10 and 210 and State Route 57, which have historically driven population growth and economic development in the area. Despite its urbanization, the Region maintains significant connection to natural resources, particularly along the northern foothill interface, which also presents specific climate vulnerabilities such as wildfire risk.

2.2. Water Agencies in the Region

Management of the Region's water resources involves a hierarchy of water suppliers, including a regional wholesaler and multiple retail agencies. TVMWD acts as the regional wholesaler, bridging the gap between the imported water supplies from MWD – a regional wholesale cooperative responsible for importing and managing Colorado River and State Water Project (SWP) supplies for Southern California – and the retail agencies that serve residents and businesses. The retail agencies include municipalities, special districts, investor-owned utilities, and mutual water companies, each responsible for the direct management of water supply distribution, local groundwater extraction, and customer service.

2.2.1. Water Supply Managers, Wholesalers, and Retailers

TVMWD is a public agency formed by election of voters in 1950. As a member agency of MWD, TVMWD is the primary wholesale water supplier for the Region. TVMWD is responsible for long-range regional water supply management, including the importation of supplemental water from the SWP and the Colorado River Aqueduct (CRA) via MWD. TVMWD manages the transmission pipelines and treatment facilities necessary to deliver this imported water to its member agencies. Additionally, TVMWD plays a critical role in regional groundwater management by coordinating connection to MWD's replenishment programs for the Main San Gabriel, Chino, and Six Basins.

Regional Water Agencies

There are 13 retail water agencies and/or community water systems operating within the TVMWD service area. These agencies vary in size and governance structure, but all rely on the common regional resources managed in this Plan.

For the purposes of this 2025 RUWMP, the retail agencies are categorized into two groups:

1. Participating Agencies: Seven retail agencies actively participated in the development of this Plan. Detailed descriptions of their specific service areas, water use, and supply reliability are provided in their respective chapters in **Part 2** of this Plan.
2. Other Member Agencies: Six additional agencies operate within the Region. While these agencies are not signatories to this specific RUWMP, their water demands represent a significant portion of the regional total. Therefore, their supply and demand data has been estimated and included in the Regional Context (**Part 1**) analysis to ensure an accurate assessment of total regional reliability.

Table 2-1 summarizes the water agencies within the Region.

Table 2-1. Water Management Agencies in the TVMWD Region

Agency Name	Agency Type	RUWMP Status
Three Valleys Municipal Water District	Special District (Wholesaler)	Lead Agency
City of Glendora	Municipality	Participating Agency
City of La Verne	Municipality	Participating Agency
City of Pomona	Municipality	Participating Agency
Golden State Water Co. (Claremont)	Investor-Owned Utility	Participating Agency
Golden State Water Co. (San Dimas)	Investor-Owned Utility	Participating Agency
Rowland Water District	Special District	Participating Agency
Walnut Valley Water District	Special District	Participating Agency
City of Covina	Municipality	Other Member Agency
Suburban Water Systems	Investor-Owned Utility	Other Member Agency
Covina Valley Water Company Retail (Formally Valencia Heights Water Company)	Mutual Water Company	Other Member Agency
Cal Poly Pomona	State University	Other Member Agency
Mt. San Antonio College	Community College	Other Member Agency
Boy Scouts (Firestone Reservation)	Non-Profit/Institutional	Other Member Agency

2.3. Population and Demographics

Understanding the demographic makeup and growth trajectory of the TVMWD service area is essential for accurately projecting future water demands, designing effective conservation programs, and developing equitable long-term water management strategies. While the Region experienced periods of rapid residential and commercial expansion throughout the late 20th century, recent demographic data indicates a transition toward stabilized, modest population growth driven primarily by urban infill and redevelopment.

2.3.1. Historic Population Growth

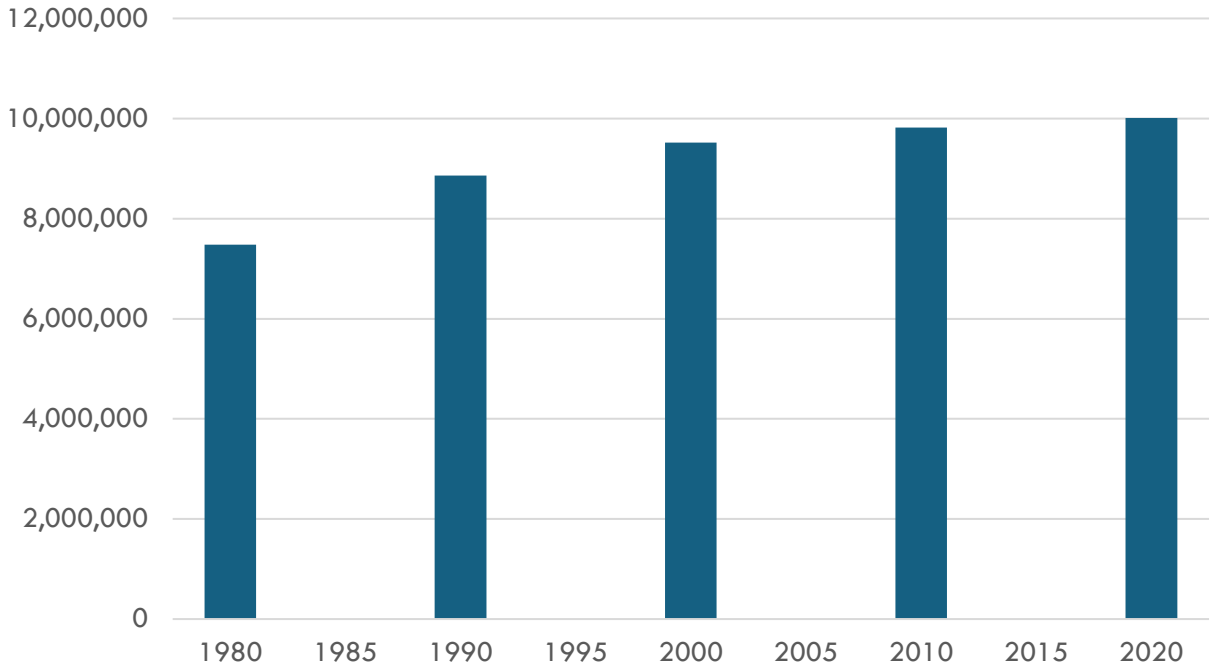
The Region covers the eastern part of Los Angeles County, as well as the eastern half of the San Gabriel Valley. Because of the San Gabriel Valley's close relationship with the economy and job market of the general Los Angeles region, economic trends that affect housing demands and job growth in Los Angeles

can be generally applied to San Gabriel Valley and the TVMWD service area. Historic U.S. Census population values and average annual growth rates for Los Angeles County are shown in **Table 2-2.** and **Figure 2-2**. Between 1980 and 2000, Los Angeles County grew rapidly, adding nearly 140,000 people each year from 1980 to 1990. By 2000, growth slowed and has been flattening out, gaining only 20,000 people per year from 2010 to 2020. Going forward, the population of Los Angeles County is projected to decline through 2050, as discussed in the following section.

Table 2-2. Los Angeles County Population, 1980 to 2020

Los Angeles County Population	1980	1990	2000	2010	2020
Population	7,477,239	8,863,052	9,519,315	9,818,605	10,014,009
Average Annual % Increase		1.71%	0.72%	0.31%	0.20%
Annual Average Population Increase, people per year		139,000	66,000	30,000	20,000

Figure 2-2. Los Angeles County Population, 1980 to 2020



U.S. Census data indicate the TVMWD service area has experienced somewhat slower population growth than the greater Los Angeles County area. The Census populations for the TVMWD service area and annual average growth rates are shown in **Table 2-3**.

Table 2-3. TVMWD Population, 1990 to 2020

TVMWD Population	1990	2000	2010	2020
Population	474,112	508,711	506,446	515,688
Average Annual % Increase		0.71%	(0.04%)	0.18%
Annual Average Population Increase, people per year		3,460	230	920

2.3.2. Future Population Projections

According to the California Department of Finance projections, the population of Los Angeles County is projected to decline from 2025 to 2050, as shown in **Table 2-4** (DOF, 2025).

Table 2-4. Los Angeles County Projected Population, 2025 to 2050

Projected Population	2025	2030	2035	2040	2045	2050
Population	9,853,842	9,867,515	9,840,458	9,775,762	9,684,285	9,554,157
Average Annual % Increase	(0.32%)	0.03%	(0.05%)	(0.13%)	(0.19%)	(0.27%)
Annual Average Population Change, people per year	(32,000)	3,000	(5,000)	(13,000)	(18,000)	(26,000)

To project population for the TVMWD service area, the Southern California Association of Governments (SCAG) demographics and growth forecast for the 2024 Connect SoCal Regional Transportation Plan (RTP) were used (SCAG, 2024). These projections include estimated population, households, and employment in 2019, 2035, and 2050 inside each of the approximately 13,062 traffic analysis zones (TAZs) that cover the SCAG region. SCAG publishes data per jurisdiction and TAZ as GIS shapefiles. This data is intersected with supplier service areas to provide an estimate of population within service areas for 2019, 2035, and 2050. SCAG prepares demographic forecasts based on land use data for their region and outside sources such as the 2020 Census and Regional Housing Needs Assessment (RHNA). SCAG incorporates essential land use planning information to reflect anticipated future populations and land uses.

In 2022, SCAG launched the Local Data Exchange (LDX), a tool where jurisdictions can directly input their data. This change has increased data input, participation, and validation for the 2019, 2035, and 2050 projections. SCAG's projections undergo extensive local review, incorporating zoning information from city and county general plans, input from local planners and jurisdictions, and coordination with local or regional land use authorities.

SCAG's 2024 population growth projections have declined from the last Connect SoCal RTP in 2020, due to ongoing economic impacts of COVID-19, pandemic-related death increases, increasingly negative net domestic migration, decline in births, and near-zero level of foreign immigration. SCAG's 2024 update uses a 2019 base year and incorporates a broader data range from 2016 to 2022, capturing key post-COVID shifts in population, employment, and household trends.

Figure 2-3 Table 2-5 provides a comparison of population projections from the 2020 and 2024 Connect SoCal RTP. While 2024 SCAG projects slower growth, the result still shows a minor increase in population within the TVMWD service area, which is estimated to grow by about 30,000 people by 2050 from a 2020 Census value of 515,688. **Table 2-5** shows 2024 Connect SoCal RTP projections along with a percent growth rate from 2030 to 2050. **Table 2-6.** and **Table 2-7** show SCAG projections of households and employment (jobs) for the TVMWD service area, respectively. Near-term employment trends are discussed in more detail in the next section.

Table 2-5. Projected Population for the Region (2030 to 2050)

Projected Population	2030	2035	2040	2045	2050
Total	532,566	538,918	541,174	543,431	545,688
% Growth Rate		0.24%	0.08%	0.08%	0.08%

Figure 2-3. Connect SoCal RTP Population Projection Comparison

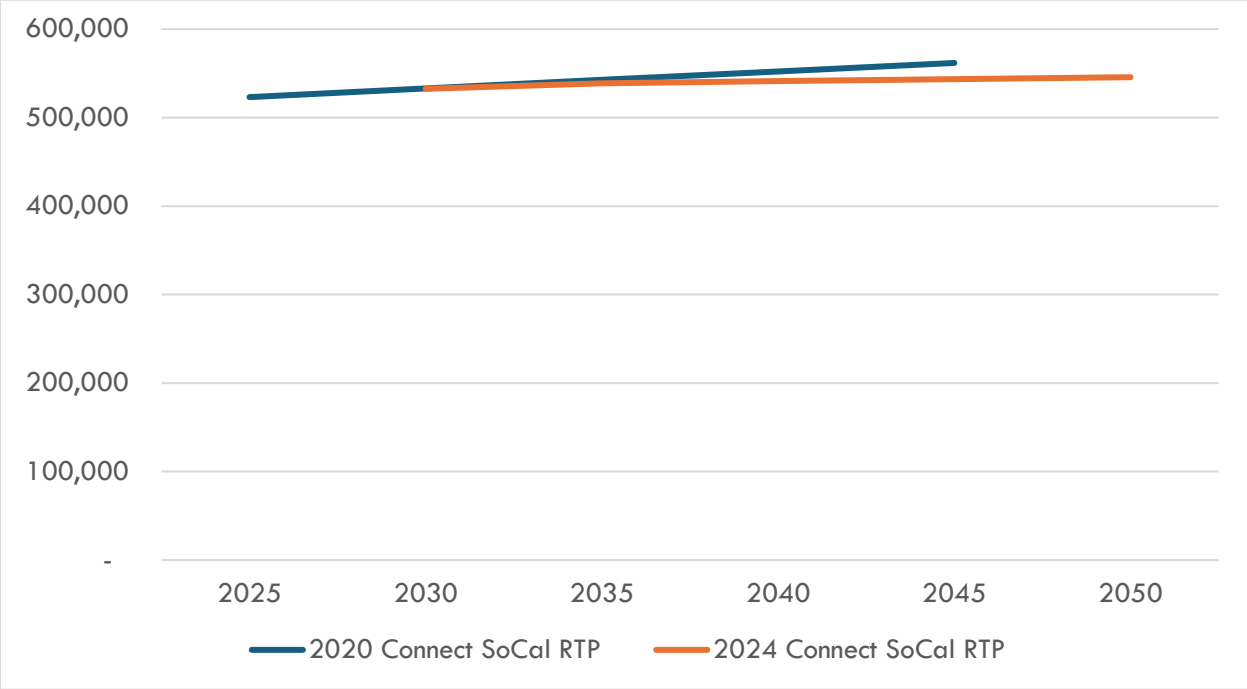


Table 2-6. Projected Household for the TVMWD Service Area (2019 to 2050)

Projected Households	2019	2035	2050
Total	159,913	183,170	188,818
% Growth Rate		0.85%	0.19%

Table 2-7. Projected Employment for the TVMWD Service Area (2019 to 2050)

Projected Jobs	2019	2035	2050
Total	233,679	243,785	245,538
% Growth Rate		0.26%	0.04%

2.3.3. Other Demographic Information

The Region comprises about half of the San Gabriel Valley, on the eastern portion of the Los Angeles County as described in **Section 2.3.1**. Economic conditions in the Region can be reflected by the 2025 San Gabriel Valley Economic Forecast prepared by the San Gabriel Valley Economic Partnership and Cal Poly Pomona (SGVEP & Cal Poly Pomona, 2025). Overall, the Region has been experiencing a slowdown in economic growth for 2025, due to the effects of the COVID-19 pandemic. Like most communities in Southern California, the post-pandemic recovery period is still present today.

Currently, the San Gabriel Valley is experiencing long-term economic impacts from wildfires, such as displacement of residents, business disruption, and rebuilding costs. The San Gabriel Valley was affected by multiple wildfires in January of 2025, burning over 38,000 acres of Los Angeles County. A high demand of housing and rental increases have left residents to be displaced or migrate out of the San Gabriel Valley. The forecast indicates that most rebuilding activity is expected to occur over multiple years rather than in the near term. The San Gabriel Valley is expected to continue experiencing the economic effects of the wildfires over the coming years.

In developing the economic forecast, the San Gabriel Valley considered three major factors observed over the past year: wildfires, tariffs, and federal layoffs. Without these factors, total nonfarm employment was expected to grow steadily by approximately 0.4 percent, with job gains concentrated in the healthcare, transportation, and warehousing sectors. When these impacts are incorporated, however, 2025 is projected to result in a loss of approximately 6,500 nonfarm jobs, representing a 0.9 percent decline across the San Gabriel Valley. Manufacturing has been the sector most affected, with an estimated 2,900 jobs lost, accounting for roughly 5.7 percent of the sector's workforce. Looking ahead, total nonfarm employment is projected to rebound by approximately 4,800 jobs (0.7 percent) by 2027, relative to 2025 levels.

Disadvantaged Communities

In accordance with DWR guidance, a community is classified as a disadvantaged community (DAC) if its median household income is below 80 percent of the statewide Median Household Income (MHI) for California. The current dataset used by DWR in the DAC Mapping Tool is the U.S. Census American Community Survey 5-Year data for the 2018–2023 period (U.S. Census Bureau, 2024). Based on this dataset, the statewide MHI is $63,783, resulting in a DAC income threshold of $77,067.

A substantial number of census tracts within the Region are identified as DACs. The largest concentration of DACs is located in the eastern portion of the Region in the City of Pomona to the western portion in the Cities of Walnut and Rowland Heights, with additional DAC areas present in portions of the City of La Verne. Smaller, dispersed DAC areas are also located throughout the Region.

Many DAC residents within the Region are served by public water systems and receive water supplies that meet all applicable state and federal drinking water quality standards from the water agencies serving their communities. While water quality standards are met, affordability remains a challenge in some DAC areas. Communities with the highest concentrations of DAC residents have implemented assistance programs to help households manage water-related costs while continuing to ensure that water and wastewater services comply with all state and federal regulatory requirements.

2.4. Land Uses

Land use patterns within the Region are a primary driver of water demand, particularly regarding outdoor irrigation needs. As described in **Section 2.1**, the Region covers approximately 133 square miles characterized by a diverse mix of developed urban landscapes and natural foothill terrain.

The valley floors (Pomona, Walnut, and San Gabriel Valleys) are largely built-out and urbanized. The predominant land use in these areas is residential, consisting of a mix of low-density single-family homes (which historically drive higher per capita water use due to landscaping) and medium-to-high density multi-family developments. Current land use trends focus on redevelopment, "in-fill" projects, and densification (such as the addition of Accessory Dwelling Units). The northern boundary of the Region, defined by the foothills of the San Gabriel Mountains, remains largely comprised of protected open space and low-density residential interface zones. The Region also supports significant commercial and light industrial corridors, particularly along Interstates 10 and 210 and State Route 57.

A unique characteristic of the Region is the presence of major institutional land uses. The area is home to several large educational institutions, including California State Polytechnic University, Pomona (Cal Poly Pomona), Mt. San Antonio College (Mt. SAC), and the Claremont Colleges. These campuses represent distinct water use profiles, often managing large, landscaped areas, independent water infrastructure systems, and substantial demand shifts that correspond with instructional sessions and breaks.

Planning Coordination

While TVMWD and its Participating Agencies manage water supplies, most of them do not have land use authority. The authority to approve General Plans, Specific Plans, and zoning designations lies with the local municipalities (e.g., City of Pomona, City of Glendora) and Los Angeles County.

However, the California Government Code requires coordination between land use and water planning. The Participating Agencies generally voluntarily comply with local building codes and standards. Furthermore, the demand projections utilized in this Plan (and discussed in **Section 4**) rely on growth forecasts from the SCAG, which are derived from the local land use plans of the cities and counties within the Region (SCAG, 2024). SCAG conducts coordination with land use agencies as part of its regional forecast cycles. **Figure 2-4** and **Table 2-8** show the land uses within the Three Valley Region.

Figure 2-4. Regional Land Use Map

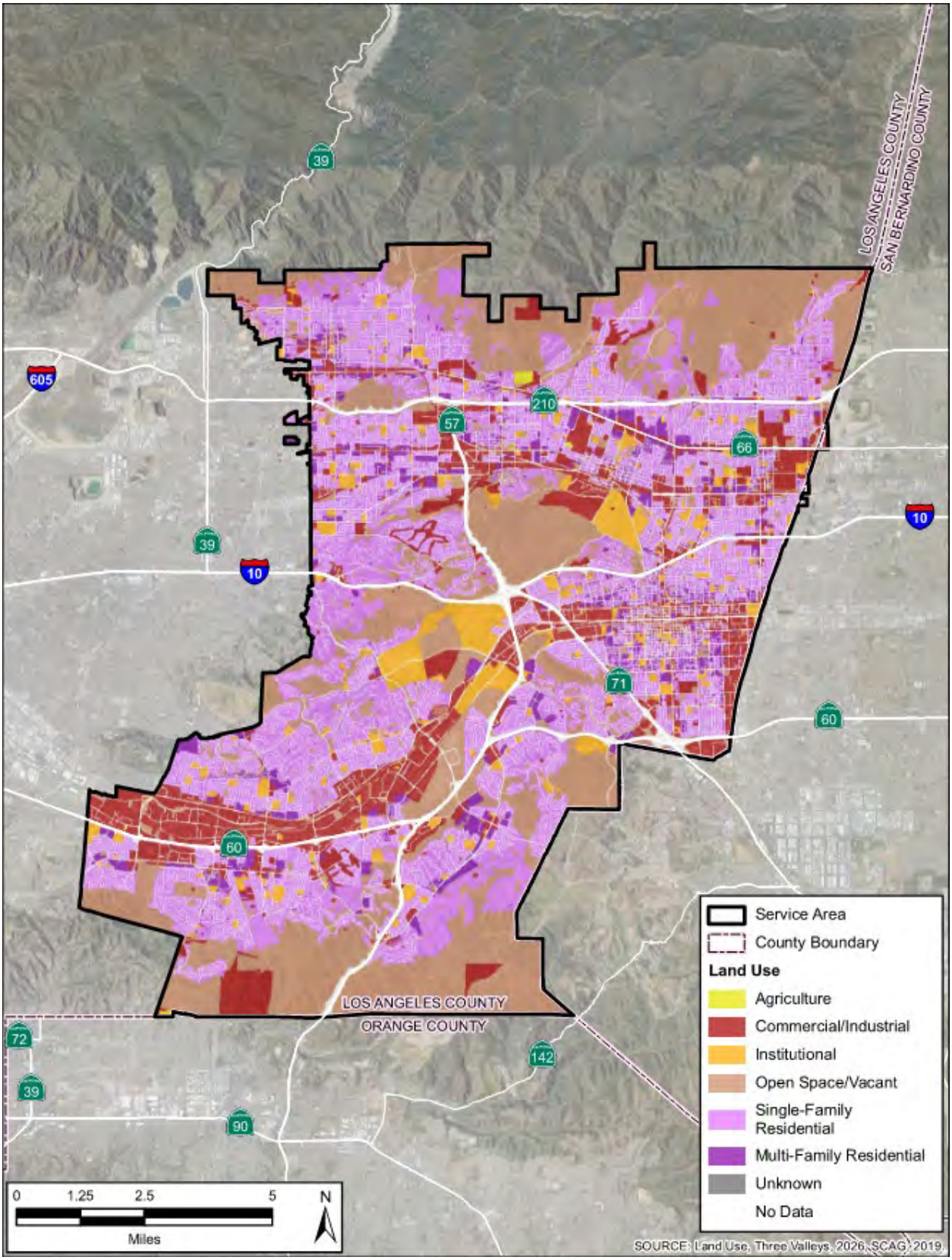


Table 2-8. Approximate Regional Land Use Distribution

Land Use Category	Description	Approximate % of Service Area
Single-Family Residential	Detached homes, typically with outdoor landscaping	38%
Multi-Family Residential	Apartments, condos, townhomes	5%
Commercial / Industrial	Retail, office parks, manufacturing, logistics	16%
Institutional	Schools, universities, hospitals, government facilities	6%
Open Space / Vacant	Foothills, parks, spreading grounds, undeveloped land	35%
Agriculture	Remnant agricultural parcels (e.g., Cal Poly campus)	<1%

2.5. Regional Climate

The climate within the Region is characterized as "Mediterranean," consisting of hot, dry summers and mild, wet winters. This seasonal pattern is the primary driver of the Region's water demand profile: water use typically peaks in the summer months (July through September) due to high outdoor irrigation demands and drops in the winter months (December through March) when rainfall is more prevalent and evaporation rates are lower.

The Region's local hydrology is heavily influenced by the San Gabriel Mountains to the north. These mountains act as a barrier to storm systems, creating an orographic effect that results in higher precipitation totals in the foothills compared to the valley floor. Surface water supplies from the San Gabriel River and San Antonio Creek account for approximately 2 percent of the Region's water supply portfolio and are directly dependent on this mountain precipitation and snowpack. Recycled water, which is largely independent of local precipitation, accounts for an additional 4 percent of the regional supply.

2.5.1. Current Regional Climate

The Region has extensive historical climate records used for planning. For evaluating historical hydrologic extremes and long-term variability, the Glendora West Station gauge serves as a key benchmark, with records dating back to 1883[2]. Historical analysis of this station indicates significant variability in the Region, with annual rainfall ranging from a low of 7.67 inches (1961) to a high of 46.55 inches (1978).

While the Glendora West Station provides an excellent centennial record for precipitation, it does not capture the full suite of climatological data necessary for modern demand modeling. Therefore, to establish the current baseline for average monthly temperatures, precipitation, and reference evapotranspiration (ETo), the Region utilizes data from the California Irrigation Management Information System (CIMIS) Station 78, located in Pomona (DWR, 2026b). **Table 2-9** summarizes these baseline climate characteristics for the Region for the last 35 years (1990-2025). This specific timeframe

[2] https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7050

was selected because it represents the full period of continuous, reliable data available for CIMIS Station 78.

Table 2-9. Regional Climate Characteristics (Jul 1990 – Sep 2025)

Month	Average Temperature (°F)	Average Minimum Temperature (°F)	Average Maximum Temperature (°F)	Average Total Precipitation (Inches)	ETo (Inches)
January	53.6	42.3	67.3	3.1	1.99
February	54.3	43.0	67.2	3.4	2.37
March	56.7	45.1	69.7	2.3	3.73
April	59.7	47.4	73.1	1.0	4.74
May	63.3	52.4	76.0	0.4	5.20
June	68.2	56.8	82.0	0.2	5.96
July	73.0	60.7	87.8	0.2	6.74
August	74.0	60.9	89.7	0.3	6.59
September	71.5	58.9	87.0	0.5	4.99
October	65.3	53.1	80.3	0.8	1.94
November	58.2	46.0	73.4	1.1	2.39
December	52.5	41.3	66.7	2.5	1.77
Annual	62.5	50.6	76.7	15.9	48.41

Source: California Department of Water Resources, CIMIS Station 78 (Pomona) (DWR, 2026b)

As shown in the table, the Region's climate creates a significant structural imbalance between natural water supply and outdoor water demand. Annual ETo (48.41 inches) is more than three times the average annual precipitation (15.9 inches). This significant deficit necessitates the application of supplemental irrigation to maintain landscaping and agriculture throughout the majority of the year. Precipitation is highly concentrated, with approximately 71 percent of the average annual rainfall (11.3 inches) occurring in a four-month window between December and March. Conversely, the summer months (June through September) experience negligible precipitation (less than 1 inch combined) while accounting for the highest ETo rates, peaking at 6.74 inches in July.

2.5.2. Potential Effects of Climate Change

Climate change adds a layer of uncertainty to the Region’s future water supply reliability. As part of development of TVMWD’s 2025 Water Resources Master Plan (WRMP) (TVMWD, 2025) (included in **Part 3, Appendix H**), TVMWD completed a Climate Change Vulnerability Assessment (Climate Assessment) in July 2024 (TVMWD, 2024a) (the Climate Assessment is included in **Part 3, Appendix I**). The Climate Assessment utilized data from DWR and 20 global climate models to project impacts on the Region’s water supplies and demands through 2045.

The assessment evaluated three potential future scenarios: (1) Drier with Extreme Warming ("Dry Hot"), (2) Median Future Conditions, and (3) Wetter with Moderate Warming ("Wet Warm"). Key climate change impacts identified in the standalone 2024 Climate Assessment include:

- Increased Temperatures and Outdoor Demand: Regional increases in average maximum temperatures are projected to reach approximately 4°F to 5°F by the mid-21st century. This warming trend is expected to increase evapotranspiration (ET) rates for landscaping and crops. Under the "Dry Hot" scenario, average annual outdoor water demand in the Region is projected to increase by approximately 5.8 percent by 2045. When combined with population growth, total water demand in the service area could increase by up to 15 percent under this scenario compared to baseline conditions.
- Hydrologic Volatility and Shorter Rainy Seasons: While the total volume of annual precipitation may not decrease drastically (projected decrease of 6.5 percent under Dry Hot conditions), the timing of rainfall is expected to shift. The Region is projected to experience a shorter rainy season with higher intensity precipitation events. This volatility poses a challenge for local spreading grounds, as storm flows may occur in peaks that exceed the immediate capacity of diversion facilities, potentially reducing the volume of water successfully captured for groundwater recharge.
- Reduced Local Surface Water: Under the “Dry Hot” scenario, flows in the San Gabriel River are projected to decrease by approximately 10 percent by 2045. This reduction directly impacts the availability of local surface water for treatment and groundwater replenishment.
- Increased Reliance on Imported Water: Due to the projected stabilization or slight decrease in local supplies (groundwater and surface water) combined with the climate-driven increase in demand, the Region’s reliance on imported water from MWD is projected to increase. The Climate Assessment indicates that imported water supply requirements could increase by approximately 15,400 acre-feet per year (AFY) by 2045 under extreme warming conditions.

While the 2024 Climate Assessment established the foundational vulnerabilities summarized above (using modeled theoretical demands through 2045), TVMWD and the Participating Agencies opted to utilize a more rigorous, hybrid analytical approach for the actual supply and demand projections presented in this 2025 RUWMP (which extends to 2050, as detailed in **Chapter 5**).

To ensure operational accuracy through 2050, the climate change factors derived from the Climate Assessment were updated through 2050 and applied directly to scale the future availability of local supplies. Conversely, rather than relying solely on modeled theoretical demand increases, this RUWMP projects future drought demands using empirical stress-test data. As described in **Chapter 5**, the relationship between actual elevated water use during the historical 2018–2022 drought and the 2021–2025 average baseline was used to establish localized drought scaling factors.

By applying these updated Climate Assessment climate factors through 2050 to the supply side and empirical historical scaling factors to the demand side, this RUWMP provides a conservative, operationally grounded assessment of the Region's reliance on imported water through 2050. Because of this shift from 2045 theoretical modeling to 2050 empirical historical scaling, the final volumetric projections in Chapter 5 supersede the preliminary 2045 estimates cited in the Climate Assessment summary above.

3. Regional Water Sources and Management

Securing a reliable water supply is the primary mission of TVMWD and its Participating Agencies. The Region relies on a diversified portfolio of water assets to meet the needs of its residential, commercial, and institutional customers.

Based on the regional baseline established for this Plan (2021–2025), the Region's water supply portfolio consists of:

- Imported Water (approximately 50%): Primarily water purchased from the MWD originating from the Colorado River and the SWP. This is supplemented by other imported or wholesale purchases from neighboring municipalities and mutual water companies.
- Local Groundwater (approximately 44%): Groundwater extracted from the Main San Gabriel, Chino, Six Basins, Spadra, Central, and Puente basins.
- Recycled Water (approximately 4%): Treated wastewater utilized for non-potable demands.
- Local Surface Water (approximately 2%): Surface flows diverted from the San Gabriel River and San Antonio Creek.

This chapter describes the current and planned water resources available to the Region through 2050. It also details the management frameworks – including legal judgments, Watermasters, and regional agreements – that govern how these resources are extracted, stored, and shared among the agencies.

Regional Water Supply Portfolio Overview

While the percentages above represent the aggregate regional supply, the specific water supply portfolios vary significantly among the individual retail agencies. Because of the Region's diverse geography, hydrogeology, and historical infrastructure development, each agency relies on a unique combination of imported water, groundwater, surface water, and recycled water.

For example, agencies located in the northern foothills may have access to local surface water diversions, while agencies in the southern portion of the Region may rely more heavily on imported water and recycled water. This diversity is a regional strength. However, it also means that each agency is impacted differently by drought, regulatory shifts, or infrastructure constraints.

Table 3-1 provides a high-level overview of the water sources currently utilized by each agency within the TVMWD service area.

Table 3-1. Overview of Water Sources Used by TVMWD Member Agencies

Agency	Groundwater	Imported Water	Surface Water	Recycled Water
Participating Agencies (RUWMP Co-Authors)	n/a	n/a	n/a	n/a
City of Glendora	✓	✓	n/a	n/a
City of La Verne	✓	✓	n/a	n/a
City of Pomona	✓	✓	✓	✓
Golden State Water Company (Claremont)	✓	✓	n/a	n/a
Golden State Water Company (San Dimas)	✓	✓	n/a	n/a
Rowland Water District	✓	✓	n/a	✓
Walnut Valley Water District	✓	✓	n/a	✓
Other TVMWD Agencies	n/a	n/a	n/a	n/a
Boy Scouts of America	n/a	✓	n/a	n/a
Cal Poly Pomona	✓	✓	n/a	✓
City of Covina	n/a	✓	n/a	n/a
Mt. San Antonio College	n/a	✓	n/a	n/a
Suburban Water Systems	✓	✓	n/a	✓
Covina Valley Water Company Retail (Formally Valencia Heights Water Company)	✓	✓	✓	n/a

Note: Some agencies purchase local surface water or groundwater that has been treated and delivered by third-party mutual water companies, such as the Covina Valley Water Company.
n/a = not applicable.

3.1. Imported Water

Imported water is the single largest source of supply for the Region. While several retail agencies' supply portfolios include external wholesale purchases (detailed in **Section 3.1.4**), the vast majority of the Region's imported water is provided by TVMWD. TVMWD is a member agency of MWD, a regional wholesaler that delivers water to 26member public agencies across Southern California. MWD imports water from two primary sources: the Colorado River via the CRA and the Sacramento-San Joaquin Bay-Delta via the SWP.

TVMWD purchases both treated and untreated imported water from MWD. Treated water is delivered directly to retail agencies through service connections to the MWD distribution system. Untreated water is delivered to TVMWD's Miramar Water Treatment Plant for treatment and distribution or used for groundwater replenishment in the Main San Gabriel and Six Basins.

3.1.1. Supply Description and Management

MWD's primary sources of water are the Colorado River and the SWP. To secure these supplies against drought, regulatory restrictions, and climate change, MWD continues to invest in a diverse resource mix, including storage (such as Diamond Valley Lake), water transfers, and conservation programs.

Colorado River Aqueduct

The CRA transports water 242 miles from Lake Havasu to Lake Mathews in Riverside County. MWD's entitlement to Colorado River water is established by the "Law of the River," a collection of compacts, federal laws, and court decrees. Although MWD's base apportionment is 550,000 AFY, MWD supplements this supply through agricultural conservation programs (such as the agreement with the Palo Verde Irrigation District) and storage programs in Lake Mead.

It is important to note that due to hydraulic constraints in the regional distribution system, several of TVMWD's member agencies are located in "SWP Dependent Areas." These areas (including parts of the cities of Glendora and La Verne) cannot receive Colorado River water and are solely dependent on supplies from the SWP.

State Water Project

The SWP, managed by DWR, transports water from Northern California to Southern California via the California Aqueduct. MWD is the largest contractor of the SWP, with a maximum Table A allocation of 1,911,500 AFY.

Actual SWP deliveries vary annually based on hydrology, reservoir storage in Northern California, and environmental regulations in the Sacramento-San Joaquin Delta. To manage this variability, MWD utilizes its significant storage capacity (surface reservoirs and groundwater banking) to store surplus water during wet years for use during dry years.

TVMWD Access to Imported Water

Historically, TVMWD accessed MWD supplies through a Purchase Order structure with tiered rates. However, MWD recently transitioned to a single volumetric rate structure (MWD 2025, 2026a). Over the most recent five-year baseline period (2021–2025), TVMWD's annual imports have averaged approximately 55,600 AFY. TVMWD continues to coordinate closely with MWD to ensure reliable, cost-effective access to imported supplies.

3.1.2. Supply Reliability and Climate Impacts

The amount of water delivered through the SWP and CRA in any given year is highly dependent on statewide hydrology, snowpack, and regulatory constraints (such as pumping restrictions in the Sacramento-San Joaquin Bay-Delta to protect endangered species). During severe, multi-year droughts, allocations from the SWP have historically dropped as low as 5 percent of contracted amounts (e.g., in 2014 and 2021). Furthermore, the Colorado River Basin has experienced a prolonged two-decade drought, leading to historic shortage declarations by the U.S. Bureau of Reclamation.

MWD Storage and Reliability Mitigation

If TVMWD relied solely on the annual yield of the SWP and CRA, the Region would face severe structural deficits during droughts. However, MWD has invested billions of dollars in a massive regional storage portfolio – including Diamond Valley Lake (DVL), Lake Mathews, Lake Skinner, and extensive Central Valley and Mojave groundwater banking programs.

Entering the 2026 planning cycle, MWD's storage reservoirs are situated at near-record highs, holding nearly 4 million acre-feet (MAF) of water. As summarized in **Table 3-2**, MWD's 2025 UWMP reliability modeling (provided in **Part 3, Appendix J**) demonstrates that even with severe cutbacks on SWP and Colorado River supplies, MWD possesses sufficient storage reserves to meet all wholesale member agency demands without triggering mandatory shortage allocations over the next five years, and projects 100 percent supply capability through 2050 under all modeled drought scenarios (MWD, 2026b).

Table 3-2. Projected Availability of TVMWD Wholesale Imported Supplies (from MWD)

Hydrologic Scenario	MWD Base Allocations (SWP and CRA)	MWD Storage Withdrawals (DVL, Groundwater Banks)	TVMWD Projected Imported Reliability
Normal Year	Average to High	Minimal (Net Storage Accumulation)	100% of Demand Met
Single Dry Year	Constrained	High (Storage Drawn Down)	100% of Demand Met
5-Year Drought	Severely Constrained	Maximum (Sustained Storage Drawdown)	100% of Demand Met

Infrastructure Constraints: SWP-Dependent Areas

While MWD's aggregate supply is highly reliable, TVMWD must navigate localized infrastructure constraints. Due to pipeline elevations and network physics, certain northern portions of the TVMWD service area – specifically serving the City of Glendora and the City of La Verne – are classified as "SWP-Dependent Areas." These zones cannot physically receive treated Colorado River water.

When SWP allocations are severely constrained during extreme droughts, MWD cannot simply substitute CRA water for these agencies. To maintain reliability in these specific zones, TVMWD and the Participating Agencies rely on local groundwater extraction, shifting supplies via the Pomona-Walnut-Rowland Joint Water Line (JWL), and utilizing TVMWD's cyclic storage accounts in the Main San Gabriel and Six Basins to offset the localized imported deficit.

To mitigate these constraints, MWD is actively constructing and planning a suite of infrastructure projects under its Capital Investment Plan designed to physically push stored water into SWP-Dependent Areas during extreme droughts.

For the eastern portion of the MWD's service area – which directly benefits TVMWD's SWP-dependent agencies like the cities of the Glendora and La Verne – MWD is constructing the Diamond Valley Lake (DVL) to Rialto Pipeline Delivery Project (anticipated completion in late 2028). This project utilizes the Wadsworth Pumping Plant to pump stored water from DVL (which includes both banked SWP and Colorado River water) north into the Rialto Pipeline, reducing the area's strict reliance on real-time California Aqueduct flows and enhancing drought reliability.

Additionally, MWD's 2025 UWMP identifies additional regional projects to provide relief to SWP-Dependent Areas across Southern California. These include west-side distribution upgrades – such as the Sepulveda Feeder Pumping Station and Greg Avenue Pump Station expansions – which reverse flow to push treated water into areas normally reliant on the West Branch of the SWP. Regionally, MWD is also advancing Pure Water Southern California, a massive, advanced water purification project that could produce up to 150 million gallons per day (MGD) of new supply. MWD is planning over 50 miles of large-

diameter pipeline from Carson to La Verne to provide raw water augmentation directly into the Weymouth Water Treatment Plant, which would further reduce the Region's demand for imported SWP supplies and increase reliability for TVMWD.

MWD Supply Reliability Modeling

As the regional wholesaler, MWD is responsible for projecting the reliability of imported water supplies for its member agencies. In its 2025 Draft UWMP, MWD assessed its ability to meet demands under normal, single-dry, and five-year consecutive drought conditions through the year 2050 (MWD, 2026b).

MWD's analysis incorporates DWR's Delivery Capability Report (DCR) CalSim models (DWR, 2025) and accounts for potential future constraints on the Colorado River. MWD's modeling demonstrates that, through the implementation of its Integrated Resources Plan, which includes active conservation, local resource development, and storage management, it has sufficient supply capabilities to meet all projected member agency supplemental water demands through 2050, even under a repeat of historic drought conditions.

Based on MWD's reliability assessment, TVMWD projects that imported water will be 100 percent reliable to meet the projected demands of its Participating Agencies through the planning horizon of this RUWMP.

3.1.3. Imported Water Quality

MWD is responsible for managing the water quality of the SWP and CRA and providing treated and untreated water that meets or exceeds all regulatory standards. The water quality of the SWP and CRA differ significantly, and the proportion of each source delivered to TVMWD fluctuates based on hydrology, MWD operational decisions, and drought conditions.

State Water Project Quality

Water imported via the SWP originates in the Sierra Nevada and flows through the Sacramento-San Joaquin Bay-Delta. SWP water is generally characterized by lower salinity, with Total Dissolved Solids (TDS) typically ranging from 250 to 350 milligrams per liter (mg/L). However, as water flows through the Sacramento-San Joaquin Bay-Delta, it picks up organic carbon and bromide. When treated with chlorine, these natural constituents can react to form Disinfection Byproducts (DBPs), which are strictly regulated by the EPA. SWP supplies are also susceptible to seasonal algal blooms, which can cause harmless but noticeable taste and odor issues, as well as suspended solids from winter storm runoff.

Colorado River Aqueduct Quality

Water imported via the CRA generally contains higher mineral content and salinity. TDS levels in CRA water are typically twice as high as SWP water, averaging between 580 mg/L and 620 mg/L, and can spike up to 700 mg/L or higher during prolonged droughts in the Colorado River Basin. In addition to higher hardness and salinity, the Colorado River watershed has historically faced localized challenges with perchlorate, uranium, and chromium-6, though MWD actively manages and monitors these constituents to ensure they remain well below regulatory limits prior to delivery. The CRA system also

requires aggressive management to control the spread of invasive Quagga mussels, which can clog intake and delivery infrastructure.

Salinity Management and Blending Strategies

Salinity is a critical water quality metric for the Region. High TDS in imported water not only affects the aesthetic quality (hardness) of drinking water but also has cascading impacts on the Region's local resources. When high-TDS imported water is used indoors, it increases the salinity of the wastewater sent to local reclamation plants. This, in turn, increases the salinity of the recycled water produced, which can limit its use for landscape irrigation and groundwater recharge due to strict Regional Water Quality Control Board Basin Plan objectives.

To mitigate this, MWD attempts to blend CRA water with lower-salinity SWP water to achieve a target TDS of approximately 500 mg/L for its treated water deliveries. However, during severe drought years when SWP allocations are drastically reduced, MWD must rely more heavily on the CRA. During these periods, TVMWD and its retail agencies experience higher salinity in their imported supplies.

Local Treatment and Operations

While MWD delivers some pre-treated water directly to TVMWD's retail agencies for potable use, TVMWD also purchases raw, untreated imported water. TVMWD is responsible for treating this raw water at the Miramar Water Treatment Plant (MWTP) located in Claremont. The MWTP utilizes conventional filtration and disinfection processes to meet all Division of Drinking Water (DDW) standards before distributing the water to member agencies. The MWTP has a design capacity of 25 MGD and is undergoing continuous modernization, including planned upgrades to incorporate Granular Activated Carbon (GAC) into its filter basins to proactively address contaminants of emerging concern.

Additionally, untreated imported water is delivered to the Covina Valley Water Company (CVWC), which treats the water at its William B. Temple Treatment Plant prior to supplying it to local agencies in the western portion of the Region. Both TVMWD and CVWC must dynamically adjust their treatment plant operations to handle the shifting water quality profiles of MWD's blend of SWP and CRA water.

3.1.4. Other Imported and Purchased Water Supplies

While TVMWD/MWD supplies constitute the vast majority of imported water in the Region, several retail agencies rely on external imports, wholesale purchases, and inter-agency transfers to meet their localized demands. To accurately capture the Region's total water portfolio in the supply and demand assessments (**Section 5**), these distinct supplies are categorized collectively as "Imported Water (Other)."

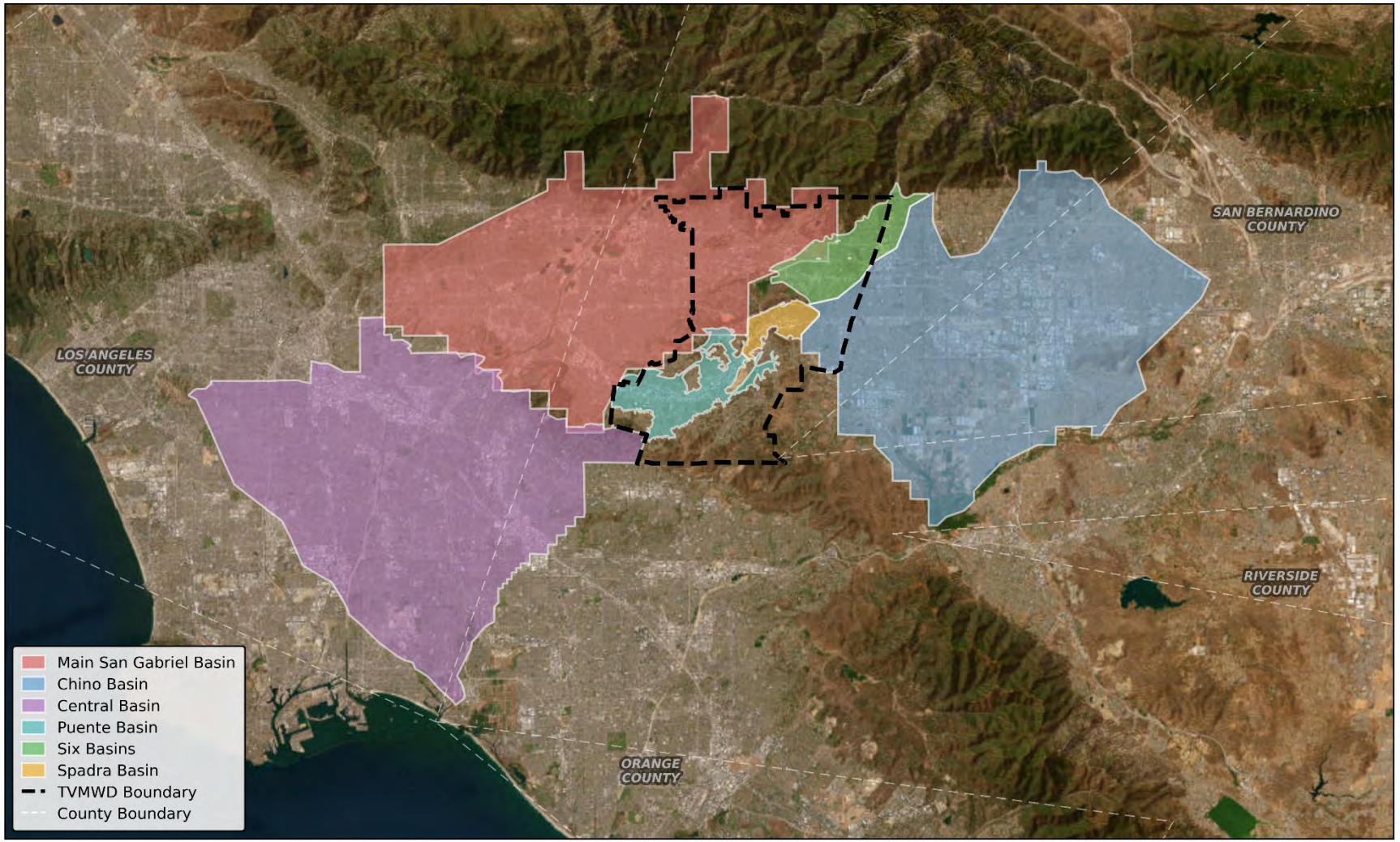
This category encompasses water secured outside of the TVMWD wholesale network. This includes wholesale purchases of treated surface water and groundwater from mutual water companies (such as the Covina Valley Water Company), purchases from neighboring municipalities (such as the City of Upland), and other external basin transfers utilized by agencies like Suburban Water Systems to serve their respective customers.

3.2. Groundwater

Groundwater is a foundational component of the Region's water supply portfolio, accounting for approximately 44 percent of the baseline water use (2021–2025 average). The Participating Agencies rely on local groundwater to meet baseload demands and to buffer against fluctuations in imported water availability during dry years.

The Region overlies a complex network of groundwater basins, each with distinct hydrogeological characteristics, recharge capabilities, and legal frameworks. The local groundwater supply utilized by the agencies within the TVMWD service area is primarily drawn from four basins that underlie the Region: the Main San Gabriel Basin, the Chino Basin, the Six Basins, and the Spadra Basin. Additionally, agencies and joint powers authorities operating within the TVMWD service area hold adjudicated groundwater rights in two supplemental basins – the Central Basin and the Puente Basin – which are hydrologically connected to the Region's primary basins but lie partially or wholly south of the TVMWD service area boundary. **Figure 3-1** summarizes the groundwater basins in the Region.

Figure 3-1. TVMWD Regional Groundwater Basins



Groundwater extraction within the Region is highly regulated. The Main San Gabriel, Chino, Six Basins, Central, and Puente Basins are adjudicated, meaning that groundwater rights, safe yields, and recharge obligations are governed by court judgments and managed by court-appointed Watermasters or administrative bodies. Because they are adjudicated, these basins are exempt from the requirement to develop a Groundwater Sustainability Plan (GSP) under the Sustainable Groundwater Management Act (SGMA). The Spadra Basin is the only non-adjudicated basin utilized by the Region and is managed locally in compliance with SGMA.

While TVMWD acts primarily as a wholesale importer and only directly produces a small amount of groundwater from the Six Basins, it plays a vital role in regional groundwater sustainability. TVMWD delivers untreated imported water to replenish these local aquifers and maintains significant cyclic storage accounts to ensure water is available during extended droughts.

The physical characteristics, management structures, TVMWD's and the Participating Agencies' specific involvement in each of these basins are detailed in the following subsections.

3.2.1. Main San Gabriel Basin

The Main San Gabriel Basin (DWR Basin No. 4-013) is the primary groundwater basin of the Region's local supply, providing approximately 64 percent of the total regional groundwater utilized by agencies within the TVMWD service area. Within the context of this RUWMP, it primarily serves the western portion of the Region, including the City of Glendora, Golden State Water Company (San Dimas), and several Other Member Agencies such as Suburban Water Systems and the City of Covina.

Physical Characteristics and Hydrogeology

The Main San Gabriel Basin lies in eastern Los Angeles County and encompasses a surface area of approximately 167 square miles. The basin is bounded by the San Gabriel Mountains to the north, the Raymond fault to the northwest, the Repetto, Monterey, and Puente Hills to the south and southwest, and the San Jose fault to the east.

The basin's water-bearing formations consist of highly permeable alluvial deposits of sand, gravel, and silt. The basin is primarily drained by the San Gabriel River and the Rio Hondo. Dominant recharge to the sub-basin comes from the percolation of precipitation, infiltration of runoff from the San Gabriel Mountains, and the artificial recharge of imported water and recycled water at spreading grounds operated by the Los Angeles County Department of Public Works. Because of the basin's high permeability, it responds rapidly to both extraction and recharge events, making it an ideal basin for large-scale conjunctive use and water banking. **Table 3-3** summarizes the aggregated historical groundwater production from the Main San Gabriel Basin by retail agencies within the TVMWD service area over the 2021–2025 baseline period.

Table 3-3. Historical Groundwater Production from the Main San Gabriel Basin by TVMWD Agencies (AFY)

Water Source / Agency	2021	2022	2023	2024	2025	5-Year Average
Participating Agencies	12,483	11,055	9,022	9,951	12,645	11,031
Other TVMWD Agencies*	29,120	28,961	28,568	29,005	28,940	28,919
Regional Total	41,603	40,016	37,590	38,956	41,585	39,950

*Note: To accurately reflect the total regional reliance on the Main San Gabriel Basin, this table incorporates estimated groundwater production for Other Member Agencies within the TVMWD service area. Because these agencies are not formal signatories to this 2025 RUWMP, their historical production volumes were estimated utilizing the best available public data, including 2020 UWMPs and recent Main San Gabriel Basin Watermaster Annual Reports.

Adjudication and Basin Management

The Main San Gabriel Basin was adjudicated in 1973 (Upper San Gabriel Valley MWD v. City of Alhambra). The Judgment (included in **Part 3, Appendix K**) established the Main San Gabriel Basin Watermaster to manage the basin and defined the prescriptive pumping rights of the overlying producers.

Instead of a fixed safe yield, the Watermaster manages the basin through an Operating Safe Yield (OSY), which is determined annually based on groundwater elevations, rainfall, and anticipated imported water availability. Historical OSYs for the Main San Gabriel Basin are shown in **Table 3-4.**

Table 3-4. Historical and Projected Operating Safe Yield of the Main San Gabriel Basin

Fiscal Year(s)	Operating Safe Yield (AF)
2010-2011	170,000
2012	210,000
2013	200,000
2014	180,000
2015-2024	150,000
2025-2026	160,000
2027-2030*	140,000

*Note: Projected OSYs are from *Main San Gabriel Basin Watermaster Report on Final Determination of Operating Safe Yield for 2025-26 Through 2029-30* (Main San Gabriel Basin Watermaster, 2025)

Pumping rights for each producer are calculated as a percentage of the OSY. However, extractions are not limited to a producer's pumping rights. If a producer extracts water in excess of their right, they incur a "Replacement Water" assessment. The Watermaster uses these assessments to purchase untreated imported water to recharge the basin, thereby ensuring long-term sustainability and preventing overdraft.

Additionally, the Main San Gabriel Basin Watermaster annually adopts a Five-Year Water Quality and Supply Plan (included in **Part 3, Appendix K**) to proactively manage the basin's groundwater quality and coordinate the delivery of Replacement Water (Main San Gabriel Watermaster, 2023). Because the Main San Gabriel Basin contains multiple EPA Superfund sites and areas impacted by legacy contaminants

(such as VOCs, PFAS, and nitrates), this Five-Year Water Quality and Supply Plan serves as a critical regulatory and reliability tool. It outlines the strategic funding and deployment of wellhead treatment facilities to prevent the migration of contaminant plumes. By treating contaminated groundwater and aggressively managing recharge, the Watermaster prevents wells from becoming "stranded," thereby safeguarding the basin's OSY and preventing unexpected, emergency spikes in demand for TVMWD's imported water during droughts.

Projected Supply Methodology

Because the OSY is determined annually by the Watermaster based on real-time hydrological conditions, reservoir storage, and groundwater elevations, this RUWMP does not attempt to forecast a firm administrative OSY out to the year 2050. Instead, to ensure this aggregated regional projection is realistic, TVMWD and the Participating Agencies compared the anticipated future groundwater extractions against the recent historical range of the basin's OSY.

Future local groundwater supplies from the Main San Gabriel Basin were developed using a bottom-up, agency-specific approach. For the Participating Agencies, the TVMWD Climate Assessment's groundwater climate factors (discussed in **Section 2.5.2**) for 2030-2050 were applied directly to each agency's individual 2021-2025 actual average pumping baseline (TVMWD, 2024a). For the Other Member Agencies, Main San Gabriel Basin extractions were estimated utilizing the best available public data, as shown in **Table 3-5**. These individual projections were then aggregated to determine the total regional Main San Gabriel Basin supply through 2050.

Based on this bottom-up aggregation, regional extractions from the Main San Gabriel Basin are projected to range from 40,886 AF in 2030, gradually decreasing to 40,102 AF by 2050. Because these projected extractions fall below the Region's historical five-year average (41,046 AFY) during the basin's most restrictive recent historical OSYs (150,000-160,000 AF), this analysis confirms that the projected extractions remain highly plausible and can be sustainably managed through the Watermaster's existing Replacement Water assessment framework.

TVMWD's Role and Storage Programs

As a regional wholesaler, TVMWD is a critical partner in the management of the Main San Gabriel Basin. TVMWD delivers untreated imported water from MWD to the basin's spreading grounds to satisfy the Replacement Water obligations of the pumpers located within TVMWD's service area.

To capture additional imported supplies during wet years when MWD water is abundant, TVMWD participates in a Cyclic Storage Program within the basin. The Cyclic Storage Agreement between MWD, TVMWD, and the Watermaster (included in **Part 3, Appendix K**) allows for the pre-delivery and storage of up to 50,000 AF of imported water. This agreement, originally signed in 1991, was recently amended effective June 2024 to extend the termination date to June 2034. TVMWD had approximately 3,079 AF stored in the basin as of the end of 2025.

Additionally, the Puente Basin Water Agency (PBWA) – a joint powers authority between Rowland Water District and Walnut Valley Water District – maintains a storage and export agreement with the

Main San Gabriel Basin for 30,000 AF (included in **Part 3, Appendix K**). This banking arrangement allows PBWA to purchase surplus imported water or local supplies when available, bank them in the Main San Gabriel Basin, and subsequently extract and export that water to the Rowland and Walnut Valley service areas during dry years or periods of imported supply constraint. This provides a critical local buffer for these two retail agencies, which are historically highly dependent on imported water.

Table 3-5 summarizes the current regional storage agreements and capacities within the Main San Gabriel Basin.

Table 3-5. TVMWD Storage and Export Agreements in the Main San Gabriel Basin

Agreement / Account Type	Managing Entities	Maximum Storage Capacity (AF)	Estimated Stored Balance (End of 2025) (AF)
Cyclic Storage Agreement	TVMWD, MWD, Main Basin Watermaster	50,000	3,079
Storage and Export Agreement	PBWA	30,000	3,000[1]

1. Balance estimated based on the PBWA Board of Commissioners' October 2024 authorization to purchase 3,000 AF of cyclic storage for the 2025-2029 water years (PBWA, 2024).

3.2.2. Chino Basin

The Chino Basin (DWR Basin No. 8-02.01) provides approximately 17 percent of the total regional groundwater utilized by agencies within the TVMWD service area. Within the context of this RUWMP, extraction from the Chino Basin is predominantly utilized by the City of Pomona to serve the eastern portion of the Region.

Physical Characteristics and Hydrogeology

The Chino Basin is a large groundwater basin located in the southwest corner of San Bernardino County and the northwest corner of Riverside County. The basin is bordered by the San Gabriel Mountains to the north, the Rialto-Colton fault to the east, and the Jurupa Mountains and Puente Hills to the south and southwest. The surface area of the Chino Basin is approximately 154,000 acres (or 240 square miles). The San Antonio Creek and Cucamonga Creek drain the Chino Basin area southward and flow into the Santa Ana River. The Chino Basin is a subbasin of the Upper Santa Ana Valley Groundwater Basin and has a total storage capacity of approximately 5,000,000 AF.

The basin consists of highly permeable alluvial deposits. Surface drainage in this portion of the region flows generally southward via San Antonio Creek and Chino Creek toward the Santa Ana River. The principal sources of natural recharge are percolation of precipitation and infiltration of runoff from the San Gabriel Mountains. This is supplemented by significant artificial recharge of imported water and recycled water managed by regional partners.

Adjudication and Basin Management

The Chino Basin was adjudicated in 1978 (Chino Basin Municipal Water District v. City of Chino et al.) (included in **Part 3, Appendix L**). The Judgment established the Chino Basin Watermaster to account for

and implement the management of the basin, and it contains a physical solution to meet the requirements of all water users.

The Chino Basin Judgment originally established a Safe Yield for the Chino Basin of 140,000 AFY. The Safe Yield is typically recalculated every 10 years and is defined in the Chino Basin Judgment as "the long-term average annual quantity of ground water (excluding replenishment of stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Chino Basin under conditions of a particular year without causing an undesirable result". Pursuant to the most recent Safe Yield reset effective in 2020, the Safe Yield for the Chino Basin is currently 131,000 AFY (effective from July 1, 2020 to June 30, 2030).

In April 2017, a Court Order regarding the Safe Yield of the Chino Basin (San Bernardino County Superior Court, 2017) was issued, which caused the Safe Yield to be recalculated in 2025. The 2017 Safe Yield Court Order also required changes to the Safe Yield Reset methodology. The methodology was updated in 2022, and the 2025 Safe Yield Reset process began in 2023. The 2025 Safe Yield Reset is not yet final, so for purposes of this UWMP, the Safe Yield for the Chino Basin is based on the currently effective value of 131,000 AFY. Additional information on the 2025 Safe Yield Reset is available on the Chino Basin Watermaster website (https://www.cbwm.org/pages/syrm/).

The Chino Basin Judgment's allocation of the Safe Yield includes three separate pools:

1. Overlying Agricultural Pool (farmers, State of California, and other minimal producers)
2. Overlying Non-Agricultural Pool (businesses and industries)
3. Appropriative Pool (cities, agencies, and other water suppliers, including Ontario)

As of July 2020, the Safe Yield is allocated among these three pools at 82,800 AFY to the Overlying Agricultural Pool, 7,366 AFY to the Overlying Non-Agricultural Pool, and 40,834 AFY to the Appropriative Pool.

Appropriators who are Parties to the Chino Basin Judgment are authorized to produce groundwater in excess of their rights. For any groundwater produced in excess of their rights, Appropriators pay assessments to the Chino Basin Watermaster, which are used to purchase water to replenish the Chino Basin. The Chino Basin Watermaster purchases water from MWD through IEUA and/or TVMWD, on behalf of the Parties, to replenish the Chino Basin. Occasionally, Watermaster has purchased water from storage accounts from parties within the Chino Basin.

In addition to the water rights described above, the Judgment provides for additional provisions to allocate the Chino Basin water as described below:

Land Use Conversion

When land is converted from agricultural to urban use, water rights are permanently transferred from the Overlying Agricultural Pool to the Appropriative Pool. Land use conversions assign the increase in Appropriative Pool rights to the party whose sphere of influence includes the converted land.

Annual Unused Overlying Agricultural Pool Rights

The Chino Basin Watermaster also reallocates the unused portion of the Chino Basin Safe Yield from the Overlying Agricultural Pool to the Appropriative Pool members' rights in any year. These transfers are permanent if agricultural land has been converted to non-agricultural use (described above), or temporary if agricultural pool extractions are less than their share of the Safe Yield. From FY20/21 to FY24/25, 9,000 AFY of rights have been reallocated from the Overlying Agricultural pool to the Appropriative Pool that were not claimed as part of a permanent land conversion.

Today, the basin is comprehensively managed through the implementation of the Optimum Basin Management Program (OBMP) (included in **Part 3, Appendix L**), which was originally developed in 2000 and updated in 2020 (Chino Basin Watermaster, 2020). The OBMP functions similarly to a GSP under SGMA, featuring robust monitoring, subsidence management, and coordinated recharge programs to ensure long-term sustainability.

Chino Basin Storage Management Plan

The Peace Agreement (2000) (included in **Part 3, Appendix L**) establishes rules and regulations, standard storage agreements, and related forms for storage in the Chino Basin. Since 2000, Chino Basin Watermaster administers groundwater storage in the Chino Basin pursuant to the storage management plan described in the 2000 OBMP.

There are five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery.

- Excess Carryover Account – includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and OSY for Appropriative Pool Parties) and Basin Water purchased or transferred from other Parties.
- Local Supplemental-Recycled Account– includes recycled water that is recharged by a producer and similar water acquired from other Parties.
- Local Supplemental-Imported Account– includes imported water that is recharged by a producer and similar water acquired from other Parties.
- Pre-2000 Quantified Supplemental Account – functions similar to Local Supplemental Water Account.
- Storage and Recovery Account – holds Supplemental Water (imported or recycled) and is intended to provide a broad and mutual benefit to the Parties of the Judgment.

Dry Year Yield Program

MWD's Dry-Year Yield Program (DYYP) is the only active Storage and Recovery Program in Chino Basin. This program is a water exchange as discussed in **Section 3.7.1**.

Table 3-6 summarizes the aggregated historical groundwater production from the Chino Basin by retail agencies within the TVMWD service area over the 2021–2025 baseline period.

Table 3-6. Historical Groundwater Production from the Chino Basin by TVMWD Agencies (AFY)

Water Source / Agency	2021	2022	2023	2024	2025	5-Year Average
Participating Agencies	10,255	11,222	11,111	11,440	10,734	10,952
Other TVMWD Agencies	0	0	0	0	0	0
Regional Total	10,255	11,222	11,111	11,440	10,734	10,952

Projected Supply Methodology

Utilizing the same bottom-up, climate-scaled methodology described for the Main San Gabriel Basin (see **Section 3.2.1**), future local groundwater supplies from the Chino Basin were projected through 2050. This approach ensures regional consistency while aligning with the management criteria established by the Chino Basin Watermaster.

Based on this regional aggregation, extractions from the Chino Basin by agencies within the TVMWD service area are projected to range from 11,053 AF in 2030, gradually decreasing to 10,204 AF by 2050. While the near-term projected extraction (11,053 AF) represents a slight increase over the 2021–2025 historical baseline average (10,952 AFY), these extractions remain consistent with the agencies' historically exercised rights within the basin's Appropriative Pool. As described above, because the Chino Basin is strictly adjudicated, all extractions – by TVMWD agencies and the numerous other overlying and appropriative purveyors sharing the basin's 131,000 AF Operating Safe Yield – are comprehensively tracked by the Watermaster. Any pumping that exceeds an individual agency's specific allocated share is mitigated through mandatory replenishment assessments used to purchase imported recharge water. Therefore, this analysis confirms that the projected extractions by TVMWD agencies are plausible and can be sustainably managed within the Optimum Basin Management Program (OBMP) framework.

TVMWD's Role and Storage Programs

Because the Chino Basin largely falls outside of TVMWD's primary wholesale service boundaries, TVMWD's interaction with the basin is facilitated through partnerships with its member agencies, primarily the City of Pomona (included in **Part 3, Appendix L**). Currently, TVMWD holds a storage account of 1,390 AF in the Chino Basin through a one-time agreement with the City of Pomona. **Table 3-7** summarizes TVMWD's current storage capacity within the Chino Basin.

Table 3-7. TVMWD Storage Agreements in the Chino Basin

Agreement / Account Type	Managing Entities	Maximum Storage Capacity (AF)	Estimated Stored Balance (End of 2025) (AF)
One-Time Storage Agreement	TVMWD, City of Pomona	1,390	1,390

3.2.3. Six Basins

The Six Basins area provides approximately 13 percent of the total regional groundwater utilized by agencies within the TVMWD service area. Within the context of this RUWMP, it is a vital local supply

source for the City of Pomona, the City of La Verne, Golden State Water Company (Claremont system), and uniquely, TVMWD itself, which directly extracts groundwater from this basin to supplement its wholesale portfolio.

Physical Characteristics and Hydrogeology

Located along the base of the San Gabriel Mountains, the Six Basins area overlies a portion of the eastern San Gabriel Valley in Los Angeles County and western San Bernardino County. The area is bounded by the San Gabriel Mountains to the north, the San Jose Hills to the south, the Main San Gabriel Basin to the west, and the Chino Basin to the east.

As the name implies, the area consists of six interconnected groundwater sub-basins: Canyon Basin, Upper Claremont Heights Basin, Lower Claremont Heights Basin, Pomona Basin, Live Oak Basin, and Ganesha Basin. The primary source of natural groundwater replenishment is surface-water runoff from precipitation falling on the San Gabriel Mountains, which infiltrates through highly permeable sediments, predominantly at the San Antonio Spreading Grounds. **Table 3-8** summarizes the aggregated historical groundwater production from the Six Basins by retail agencies within the TVMWD service area over the 2021–2025 baseline period.

Table 3-8. Historical Groundwater Production from the Six Basins by TVMWD Agencies (AFY)

Water Source / Agency	2021	2022	2023	2024	2025	5-Year Average
Participating Agencies	9,581	8,728	6,682	7,629	9,597	8,444
Other TVMWD Agencies	0	0	0	0	0	0
Regional Total	9,581	8,728	6,682	7,629	9,597	8,444

Adjudication and Basin Management

The pumping and storage rights for the Six Basins were adjudicated in 1998 (Southern California Water Company vs. City of La Verne, et al., Case No. KC029152). The Judgment (included in **Part 3, Appendix M**) established the Six Basins Watermaster to oversee the physical solution and coordinated management of the interconnected basins.

Pursuant to the Judgment, the statutory safe yield of the Six Basins is 19,300 AFY, defined as the amount of water that can be produced by the parties on an annual basis to ensure long-term, sustainable groundwater production. For management purposes, the Judgment divides the Six Basins into two distinct operational areas. The production, replenishment, and recovery of the Live Oak and Ganesha Basins (collectively referred to as the "Two Basins") are reserved solely for the City of La Verne and are not subject to groundwater production limitations, provided that La Verne's production does not substantially injure the rights of any other Six Basin parties.

Conversely, the Canyon, Upper Claremont Heights, Lower Claremont Heights, and Pomona Basins (collectively referred to as the "Four Basins") are managed using an OSY rather than a static safe yield. The Watermaster annually determines the OSY based on current groundwater elevations, precipitation, and recharge capabilities to ensure the parties can reliably pump their respective rights while preventing

overdraft and mitigating the risk of high groundwater damaging shallow infrastructure during wet periods. **Table 3-9** summarizes the recent OSY determinations for the Four Basins.

Table 3-9. Recent Operating Safe Yields (Four Basins)

Calendar Year	Operating Safe Yield (AF)
2011-2013	17,500
2014	16,500
2015-2016	16,000
2017	14,000
2018	13,500
2019-2023	13,000
2024	13,500
2025	14,000

Pumping rights for each producer in the Four Basins are allocated based on the annual OSY. To provide operational flexibility, the Judgment allows producers to carry over a portion of their unused annual pumping rights (up to a maximum of 25% of their share of the OSY) into the following year. Furthermore, extractions are not strictly limited to a producer's base pumping right. If a producer extracts water in excess of their right, that excess amount is either deducted from their following year's water rights or they incur a replacement water assessment. The Watermaster utilizes these assessments to purchase supplemental water (such as untreated imported water from TVMWD) to recharge the basin, thereby ensuring long-term sustainability, providing year-to-year flexibility for the pumpers, and preventing overdraft.

Additionally, the Six Basins Watermaster actively manages the basin's groundwater quality and coordinates recharge efforts through its comprehensive Strategic Plan (included in **Part 3, Appendix M**) and ongoing Watermaster management initiatives. Because portions of the Six Basins face localized water quality challenges (such as nitrate and VOC accumulation, particularly in the Pomona Basin), these management strategies serve as critical regulatory and reliability tools. They guide the strategic funding and deployment of wellhead treatment and blending facilities to prevent the migration of contaminant plumes. By treating contaminated groundwater and aggressively managing stormwater and imported water recharge at facilities like the San Antonio Spreading Grounds, the Watermaster prevents wells from becoming "stranded." This safeguards the basin's OSY and prevents unexpected, emergency spikes in demand for TVMWD's imported water during droughts.

Projected Supply Methodology

Utilizing the same bottom-up, climate-scaled methodology described for the Main San Gabriel Basin (see **Section 3.2.1**), future local groundwater supplies from the Six Basins were projected through 2050. Based on this bottom-up aggregation, regional extractions from the Six Basins are projected to range from 9,355 in 2030, gradually decreasing to 8,811 by 2050. While these projected volumes represent a slight increase over the 2021–2025 historical average (8,438 AFY), they remain conservative and sustainable. The maximum projected extraction of 9,355 AF is less than half of the basin's adjudicated Base Safe Yield (19,300 AF) and remains well below the Watermaster's most restrictive recent drought

OSY (13,000 AF, in 2021). Therefore, this analysis confirms that the projected extractions are plausible and can be sustainably managed within the Watermaster's existing framework.

TVMWD's Role and Storage Programs

TVMWD's relationship with the Six Basins is unique among the region's groundwater sources because TVMWD acts as both a replenisher and a direct producer. TVMWD owns and operates three active groundwater extraction wells located in the Six Basins. The raw groundwater produced from these wells is conveyed to TVMWD's MWTP, where it is treated and blended with imported supplies before being distributed to member agencies.

To support dry-year reliability, TVMWD holds a direct operational storage account in the Six Basins with a capacity of 3,500 AF (included in **Part 3, Appendix M**). **Table 3-10** summarizes TVMWD's current storage capacity within the Six Basins. TVMWD actively supports the replenishment of the basin by delivering untreated imported water to the San Antonio Spreading Grounds, occasionally utilizing interconnections like the City of Pomona's Canon pipeline to maximize surface water capture and recharge.

Table 3-10. TVMWD Storage Agreements in the Six Basins

Agreement / Account Type	Managing Entities	Maximum Storage Capacity (AF)	Estimated Stored Balance (End of 2025) (AF)
Operational Storage Account	TVMWD, Six Basins Watermaster	3,500	~3,500[1]

1. Based on 2024 Annual Watermaster Report (Six Basins Watermaster, 2025). Final 2025 stored balances are subject to ongoing Six Basins Watermaster reconciliation.

3.2.4. Spadra Basin

While smaller in volume than the other regional basins, the Spadra Basin provides a localized and highly valuable groundwater supply for the southeastern portion of the Region. Because groundwater produced from this basin often requires treatment or blending to comply with SWRCB-DDW drinking water standards, it is currently utilized primarily to meet non-potable overlying demands. Within the context of this RUWMP, extractions from the Spadra Basin are utilized primarily by the WVWD, the City of Pomona, and Cal Poly Pomona.

Physical Characteristics and Hydrogeology

The Spadra Basin is a small sub-basin of the larger San Gabriel Valley Groundwater Basin. It is located within the San Jose Creek valley in eastern Los Angeles County. The basin is distinctly bounded by the San Jose Hills to the north and northwest, and the Puente Hills to the south and southwest.

The basin's hydrogeology consists of alluvial deposits from surrounding highlands, with San Jose Creek serving as the primary surface drainage feature flowing westward toward the San Gabriel River. Natural recharge occurs primarily through the percolation of precipitation and surface water runoff from the San Jose Hills and Puente Hills, as well as infiltration from San Jose Creek.

SGMA Compliance and Basin Management

Unlike the Main San Gabriel, Chino, and Six Basins, the Spadra Basin is not adjudicated. Therefore, it is subject to the requirements of SGMA.

DWR has designated the Spadra Basin as a "very low-priority" basin. Under SGMA, very low-priority basins are not legally required to form a Groundwater Sustainability Agency (GSA) or adopt a GSP. However, recognizing the strategic importance of this local supply, WVWD and the City of Pomona proactively entered into a Memorandum of Agreement (included in **Part 3, Appendix N**) to collectively form the Spadra Basin GSA. The GSA has developed a GSP (included in **Part 3, Appendix N**) to comprehensively manage the basin, monitor water quality, and ensure sustainable extractions that prevent chronic lowering of groundwater levels.

Instead of an OSY determined by a Watermaster, the GSP establishes a long-term "Sustainable Yield" for the basin, which is currently estimated at approximately 1,050 AFY (Spadra Basin GSA, 2022). To ensure extractions remain within sustainable limits, the GSP defines specific Sustainable Management Criteria, including Measurable Objectives (MOs) and Minimum Thresholds for groundwater elevations.

Sustainable management practices actively implemented by the GSA include:

- Comprehensive Monitoring: Regular tracking of groundwater levels and water quality to ensure the basin operates within its established MOs and avoids "Undesirable Results" (such as the chronic lowering of groundwater levels or degraded water quality).
- Recharge Optimization: As detailed in **Section 3.9**, the GSA agencies are actively pursuing the Spadra Basin Optimization Project. By utilizing advanced treated recycled water for underground injection, the GSA aims to physically bolster the basin's Sustainable Yield and increase local extraction capacity without causing overdraft.
- Water Quality Management: Collaborating with basin producers (such as Cal Poly Pomona) to implement wellhead treatment for localized VOCs, ensuring existing wells remain operational and do not become stranded assets.

Table 3-11 summarizes the aggregated historical groundwater production from the Spadra Basin by agencies within the TVMWD service area over the 2021–2025 baseline period.

Table 3-11. Historical Groundwater Production from the Spadra Basin by TVMWD Agencies (AFY)

Water Source /Agency	2021	2022	2023	2024	2025	5-Year Average
Participating Agencies	0	0	0	0	0	0
Other TVMWD Agencies*	704	704	704	704	704	704
Regional Total	704	704	704	704	704	704

*Note: To accurately reflect the total regional reliance on the Spadra Basin, this table incorporates estimated groundwater production for Other Member Agencies within the TVMWD service area. Because these agencies are not formal signatories to this 2025 RUWMP, their historical production volumes were estimated utilizing the best available public data, including related environmental documentation and the Spadra Basin GSP.

Projected Supply Methodology

Utilizing the same bottom-up, climate-scaled methodology described for the Main San Gabriel Basin (see **Section 3.2.1**), future local groundwater supplies from the Spadra Basin were projected through 2050. This approach ensures regional consistency while adhering to the management criteria established in the Spadra Basin GSP.

Based on this regional aggregation, extractions from the Spadra Basin are projected to remain consistent at 856 AF in 2030 through 2050. Because these projected volumes align closely with the 2021–2025 historical average (704 AFY) and remain below the basin's estimated Sustainable Yield (approximately 1,050 AFY), this analysis confirms that the projected extractions are plausible and can be sustainably managed within the Spadra Basin GSA's framework. Furthermore, to increase the margin of safety and protect against climate volatility, the GSA agencies are advancing the Spadra Basin Optimization Project (detailed in **Section 3.9**) to inject recycled water and significantly expand the basin's sustainable yield threshold.

TVMWD's Role and Planned Storage Programs

Currently, TVMWD does not hold an active operational storage account in the Spadra Basin. However, expanding the use of the Spadra Basin is a key component of the Region's future mitigation and reliability strategy.

3.2.5. Central Basin

The Central Basin (DWR Basin No. 4-011.04) is a large adjudicated groundwater basin located in the Coastal Plain of Los Angeles, immediately south and southwest of the TVMWD service area. While the Central Basin is not a primary local supply source for the Region, it is included in this RUWMP because it is hydrologically connected to the TVMWD service area through the Main San Gabriel Basin and because two entities operating within the TVMWD service area – Suburban Water Systems and PBWA – hold adjudicated pumping rights within the basin. Within the context of this RUWMP, groundwater extraction from the Central Basin is utilized exclusively by Suburban Water Systems to serve the southwestern portion of its service area, providing approximately 3 percent of the total regional groundwater utilized by agencies within the TVMWD service area.

Physical Characteristics and Hydrogeology

The Central Basin is one of the largest groundwater basins in Los Angeles County, encompassing a surface area of approximately 277 square miles. The basin is a subbasin of the larger Coastal Plain of Los Angeles Groundwater Basin and is bounded on the northeast and east by the Elysian, Repetto, Merced, and Puente Hills, on the southeast by the Los Angeles County–Orange County line (roughly following Coyote Creek), and on the south and west by the Newport-Inglewood fault system and its associated uplift. The Los Angeles River and San Gabriel River drain across the surface of the Central Basin on their way to the Pacific Ocean.

The California Department of Water Resources historically divided the Central Basin into four hydrogeologic divisions: the Los Angeles Forebay, the Montebello Forebay, the Whittier Area, and the

Central Basin Pressure Area. The two forebays contain unconfined aquifers with relatively interconnected water-bearing strata extending up to 1,600 feet deep, providing the primary pathways for recharge to the deeper aquifer system. The Whittier Area and Pressure Area are predominantly confined aquifer systems consisting of permeable sands and gravels separated by semi-permeable to impermeable clay layers extending to approximately 2,200 feet below the surface. The principal water-producing formations are the Lakewood Formation and the San Pedro Formation. Total storage capacity of the basin is estimated to be approximately 13.8 million AF.

The hydrologic connection between the Central Basin and the TVMWD service area is significant: the Montebello Forebay receives both surface and subsurface inflow from the Main San Gabriel Basin through a gap in the Merced and Puente Hills at Whittier Narrows. This gap provides the primary conduit through which outflows from the TVMWD region's largest groundwater basin – including the replenishment water delivered by TVMWD to the Main San Gabriel Basin's spreading grounds – ultimately reach and recharge the Central Basin.

Adjudication and Basin Management

The Central Basin was adjudicated in 1965 (*Central and West Basin Water Replenishment District v. Charles E. Adams et al.*). The original Judgment was entered on October 11, 1965, and appointed DWR as Watermaster. The Judgment has been amended three times since its inception: the First Amended Judgment (1980) transitioned the administrative year from a water year to a fiscal year basis (July 1 through June 30); the Second Amended Judgment (1991) modified carryover and overproduction provisions; and, most significantly, the Third Amended Judgment was entered on December 23, 2013, substantially modernizing basin governance and establishing provisions for groundwater storage (Third Amended Judgment included in **Part 3, Appendix T**.

Under the Third Amended Judgment, the Central Basin Watermaster is composed of three separate bodies with distinct responsibilities:

- The **Administrative Body**: WRD serves as the court-appointed Administrative Body, responsible for the administration and enforcement of the Judgment, including accounting and reporting functions related to groundwater extractions, carryover, and storage.
- The **Water Rights Panel**: Composed of seven Central Basin water rights holders, the Panel has exclusive authority to enforce adjudicated extraction rights and manage the Exchange Pool.
- The **Storage Panel**: Composed of the Water Rights Panel and the WRD Board of Directors, the Panel reviews and approves groundwater storage projects within the basin.

Unlike the Main San Gabriel and Six Basins, which utilize an annually determined OSY that fluctuates based on real-time hydrological conditions, the Central Basin operates under fixed Allowed Pumping Allocations (APAs). Each party's APA represents 80 percent of its court-adjudicated Total Water Right. Parties are permitted to carry over unused pumping rights (up to 60 percent of their APA) into the following administrative year and may extract up to 140 percent of the sum of their APA and leased water in any given year, provided they have sufficient carryover or stored water balances. Over-

extractions by parties without stored water are limited to the greater of 20 percent of their APA or 20 AF.

The Third Amended Judgment also established formal provisions for groundwater storage in the Central Basin for the first time, designating an Adjudicated Storage Capacity of 220,000 AF. This storage capacity is apportioned between Individual Storage Accounts – sized at 50 percent of each party's APA – and a Community Storage Pool available on a first-come, first-served basis. Additionally, the Judgment established the Regional Disadvantaged Communities Incentive Program, which reserves up to 23,000 AF of the Community Storage Pool for the use or benefit of DACs within the Central Basin.

Groundwater replenishment in the Central Basin is managed by the Water Replenishment District of Southern California (WRD), which purchases imported water from MWD and recycled water from the Los Angeles County Sanitation Districts (LACSD) for recharge at the Montebello Forebay spreading grounds. WRD also manages the Alamitos Gap, Dominguez Gap, and West Coast Basin Barrier injection well projects to prevent seawater intrusion into the basin's coastal aquifers.

Table 3-12 summarizes the aggregated historical groundwater production from the Central Basin by retail agencies within the TVMWD service area over the 2021–2025 baseline period.

Table 3-12. Historical Groundwater Production from the Central Basin by TVMWD Agencies (AFY)

Water Source / Agency	2021	2022	2023	2024	2025	5-Year Average
Participating Agencies	0	0	0	0	0	0
Other TVMWD Agencies*	1,543	1,151	1,118	2,253	2,728	1,759
Regional Total	1,543	1,151	1,118	2,253	2,728	1,759

*Note: To accurately reflect the total regional reliance on the Puente Basin, this table incorporates estimated groundwater production for Other Member Agencies within the TVMWD service area. Because these agencies are not formal signatories to this 2025 RUWMP, their historical production volumes were estimated utilizing the best available public data, including Central Basin Watermaster Annual Reports published by WRD.

3.2.6. Puente Basin

The Puente Basin is a small, adjudicated groundwater basin located in eastern Los Angeles County, directly beneath the southern portion of the TVMWD service area. Unlike the Central Basin described in the preceding section, the Puente Basin lies entirely within the Region's geographic footprint and is actively managed by the PBWA. Groundwater within the Puente Basin is currently utilized exclusively for non-potable purposes. While extraction volumes are small relative to the Region's other basins (approximately 1 percent of the total regional groundwater), the Puente Basin represents a strategically important local resource that PBWA is actively working to develop through a comprehensive Groundwater Management Plan.

Physical Characteristics and Hydrogeology

The Puente Basin spans approximately 20 square miles and is situated in a narrow alluvial valley between the San Jose Hills to the north and the Puente Hills to the south. The basin shares its eastern boundary with the Spadra Basin (described in **Section 3.2.4**) and its western boundary with the Main San

Gabriel Basin (described in **Section 3.2.1**). San Jose Creek, the basin's primary surface drainage feature, flows through the basin from northeast to west, ultimately passing through Whittier Narrows into the Central Basin (described in **Section 3.2.5**).

The basin's water-bearing formations consist of alluvial deposits along the San Jose Creek valley. Natural recharge occurs primarily through the percolation of precipitation and infiltration of surface water runoff from the surrounding San Jose Hills and Puente Hills. The basin also receives subsurface inflow from the adjacent Spadra Basin to the east.

Three water districts overlie the Puente Basin boundary: Walnut Valley WD, Rowland WD, and the Upper San Gabriel Valley Municipal Water District. The basin is sandwiched between the TVMWD service area's other groundwater resources and lies along the path of San Jose Creek's westward flow, making it a critical hydrologic link in the broader regional groundwater system. The Puente Narrows Agreement, established in connection with the 1973 Main San Gabriel Basin adjudication, governs subsurface outflow from the Puente Basin into the Main San Gabriel Basin, and the 1965 Long Beach Judgment guarantees the Central and West Coast Basins an average annual water supply through Whittier Narrows that includes underflow from the Puente Basin.

Adjudication and Basin Management

The Puente Basin was adjudicated in 1985. The Judgment (included in **Part 3, Appendix U**) established the legal framework for groundwater extraction rights within the basin and recognized the basin's hydrologic connections to the adjacent Main San Gabriel and Central Basins through the Puente Narrows Agreement (included in **Part 3, Appendix U**.

Because the Puente Basin is adjudicated, it is exempt from the requirement to form a GSA or adopt a GSP under SGMA. Basin management is instead governed by the terms of the Judgment and administered through PBWA in coordination with the Upper San Gabriel Valley Municipal Water District.

Recognizing the strategic value of this local resource, PBWA is currently developing a voluntary Groundwater Management Plan (GMP) to guide the future management and beneficial use of the Puente Basin. As part of this effort, PBWA has completed several technical memoranda, including TM-1: Conceptual Understanding of the Puente Basin (PBWA, 2023); TM-2: Goals and Concepts for Improved Basin Management memorandum (PBWA, 2024a); and TM-3: Basin Management Alternatives analysis (PBWA, 2025). PBWA has conducted stakeholder meetings throughout 2024 and 2025 to solicit input on the GMP's development, with the stated objective of maximizing the beneficial use of the basin in a conjunctive manner with the Region's other water resources — including imported water from TVMWD, treated recycled water from LACSD, and groundwater from adjacent basins.

Current Groundwater Use

Groundwater within the Puente Basin is currently impaired by water quality constraints that limit its use to non-potable applications. Rowland WD operates a well within the Puente Basin that produces impaired groundwater for blending into its recycled water distribution system. This groundwater, along with treated water captured from an EPA Superfund cleanup project and recycled water purchased from

LACSD (via the San Jose Creek Water Reclamation Plant), supports Rowland WD's extensive non-potable recycled water program.

3.2.7. Groundwater Quality Impacts on Reliability

Groundwater quality in the Region is generally sufficient to meet municipal demands, provided that appropriate wellhead treatment and blending strategies are employed. The Participating Agencies and local Watermasters continuously monitor groundwater quality in accordance with the State Water Resources Control Board (SWRCB) DDW regulations and the Groundwater Ambient Monitoring and Assessment (GAMA) Program.

While local groundwater is a highly reliable source in terms of volume, its usability is constrained by historical land-use practices. Decades of agricultural, industrial, and military activities have introduced various contaminants into the underlying aquifers of the Main San Gabriel, Chino, Six Basins, Spadra, Central, and Puente basins. When wells exhibit contaminant levels exceeding the Maximum Contaminant Levels (MCLs) or Notification Levels set by DDW, they must be removed from service until treatment is installed or blending plans are approved.

Primary Contaminants of Concern

Groundwater from the Region's basins has historically exhibited exceedances for several constituents. The most prevalent contaminants requiring active management include:

- Volatile Organic Compounds (VOCs): Chemicals such as Tetrachloroethene (PCE) and Trichloroethene (TCE) are widely present, primarily resulting from legacy industrial and aerospace manufacturing in the San Gabriel Valley.
- Nitrates and Total Dissolved Solids: Elevated levels of nitrates and salts are particularly prevalent in the Chino Basin and portions of the Six Basins, stemming from historical agricultural operations, dairy farming, and the use of imported water and recycled water for recharge.
- Perchlorate: A chemical used in rocket fuel and flares, perchlorate has impacted groundwater wells in several areas, requiring specialized ion-exchange treatment.
- Contaminants of Emerging Concern (CECs) and PFAS: Per- and polyfluoroalkyl substances (PFAS) are man-made chemicals used in fire-retardant foams and consumer products. As DDW establishes strict new Public Health Goals and MCLs for PFAS (specifically PFOA and PFOS), many agencies in the Region are being forced to take wells offline and rapidly design and construct new GAC or ion-exchange treatment facilities.
- Other Constituents: 1,2,3-Trichloropropane (1,2,3-TCP), Hexavalent Chromium, Arsenic, 1,2-Dibromo-3-chloropropane (DBCP), and naturally occurring Uranium.

Table 3-13 describes the primary groundwater contaminants of concern in the Region.

Table 3-13. Primary Groundwater Contaminants and Regional Treatment Strategies

Contaminant of Concern	Primary Source / Cause	Typical Treatment Technology Utilized in Region	Impacted Basins (General)
VOCs (PCE, TCE)	Legacy industrial and aerospace manufacturing	Granular Activated Carbon (GAC), Air Stripping	Main San Gabriel, Spadra, Six Basins
Nitrates	Historical agriculture, dairy farming, fertilizers	Blending, Anion Exchange, Reverse Osmosis (RO)	Chino Basin, Six Basins
TDS (Salinity)	Agricultural runoff, imported/recycled water recharge	Reverse Osmosis (Desalters)	Chino Basin
Perchlorate	Rocket propellants, flares, explosives	Ion Exchange (IX)	Main San Gabriel, Six Basins
PFAS / PFOA	Fire-fighting foams, industrial consumer products	Granular Activated Carbon (GAC), Ion Exchange	Region-wide
1,2,3-TCP	Legacy agricultural soil fumigants	Granular Activated Carbon (GAC)	Chino Basin, Six Basins

Known Contaminant Plumes and Basin-Specific Quality

The distribution of these contaminants varies by basin:

Main San Gabriel Basin: The EPA designated portions of the San Gabriel Valley as Superfund sites due to extensive VOC contamination. Major groundwater cleanup projects, such as the Baldwin Park Operable Unit (BPOU), utilize large-scale extraction and advanced treatment facilities to contain the migration of these plumes, remove VOCs and perchlorate, and provide treated water for municipal supply.

Chino Basin: The Chino Basin faces significant challenges with TDS and nitrates. The Chino Basin Watermaster's OBMP includes the operation of regional groundwater desalters to extract and treat this degraded water, preventing the migration of poor-quality water into cleaner areas of the basin and producing potable supply.

Six Basins and Spadra Basin: Localized VOC and nitrate contamination impacts wells in these basins. Because groundwater produced from the Spadra Basin frequently requires extensive wellhead treatment or blending to comply with SWRCB-DDW drinking water standards, it is currently utilized primarily to meet non-potable overlying demands by local water agencies. To overcome these constraints and restore potable capacity, agencies are actively investing in remediation. For example, as noted in the TVMWD's WRMP (TVMWD, 2025), Cal Poly Pomona is pursuing VOC treatment at its Well No. 2 within the Spadra Basin to restore its capacity to produce potable water.

Central Basin and Puente Basin: The Central Basin faces water quality challenges common to the greater Coastal Plain of Los Angeles, including localized saltwater intrusion along its coastal margins and legacy contamination from industrial activities. WRD manages basin-wide water quality monitoring and replenishment using recycled water and imported water. The Puente Basin contains impaired groundwater that currently limits extraction to non-potable uses by Rowland WD. PBWA is actively

evaluating wellhead treatment options through its ongoing Groundwater Management Plan development process to potentially restore potable extraction capacity in the future.

Impact on Supply Reliability

Groundwater quality degradation has a direct and severe impact on the Region's water supply reliability. When local wells are shut down due to contamination (referred to in the WRMP as "stranded assets"), retail agencies lose their ability to pump their adjudicated groundwater rights. To replace this lost local supply, agencies are forced to increase their purchases of imported water from TVMWD. This dynamic shifts the burden to the imported water system, precisely when the Region is attempting to reduce its reliance on imported water due to drought and climate change vulnerabilities.

To break this cycle, TVMWD and the Participating Agencies have prioritized regional mitigation projects focused on water quality treatment. For example, the proposed GRIP+ project - a major regional partnership between TVMWD, the City of Glendora, and the City of Pomona – and City of Pomona Groundwater Quality Improvement project (described in Section 3.9) involve installing wellhead treatment (such as GAC for TCP and anion exchange for nitrates) to rehabilitate stranded wells. By investing in groundwater treatment, the Region can restore local extraction capacity, fully utilize its groundwater basin storage, and secure a drought-resilient water portfolio.

Stranded Groundwater Assets and Evolving Regulations

As detailed above, the Region overlies several historic contaminant plumes (VOCs, perchlorate, nitrates). While many of these legacy plumes are actively managed, the Region faces a significant, ongoing reliability threat from "moving regulatory targets" – specifically, the introduction of stricter MCLs for CECs.

For example, the EPA issued final National Primary Drinking Water Regulations for several PFAS compounds in April 2024 (EPA, 2024), and the SWRCB DDW continues to tighten state-level Public Health Goals and MCLs. When these new, ultra-low regulatory thresholds take effect, wells that previously met all safety standards instantly become non-compliant. These wells must be taken offline, creating "stranded assets."

3.3. Surface Water

While imported water and groundwater form the foundation of the Region’s water portfolio, local surface water provides a valuable, highly cost-effective supplemental supply. Between 2021 and 2025, local surface water use by TVMWD member agencies averaged 2,267 AFY, accounting for approximately 2 percent of the Region’s total water supply portfolio.

Surface water within the Region is primarily utilized in two ways: direct diversion for potable treatment and distribution, and diversion into spreading grounds for groundwater basin replenishment. Because surface water flows are entirely dependent on local precipitation and snowpack in the San Gabriel Mountains, this supply is highly variable and susceptible to drought conditions.

3.3.1. Surface Hydrology and Major Sources

The surface hydrology of the Region is dominated by the San Gabriel Mountains to the north, which capture precipitation and generate runoff that flows southward into the valley floors. The Region spans portions of two major watersheds: the San Gabriel River watershed to the west and the Santa Ana River watershed (via San Antonio Creek) to the east.

San Gabriel River

The San Gabriel River is the primary surface water system serving the western portion of the TVMWD service area. The river's headwaters originate in the Angeles National Forest. Runoff is captured and regulated by a series of upstream dams (including Cogswell, San Gabriel, and Morris Dams) before flowing downstream into the Main San Gabriel Basin. Flows in the San Gabriel River are highly variable, with the majority of natural runoff occurring during the winter storm season (December through March).

San Antonio Creek

San Antonio Creek serves the eastern portion of the Region. Originating near Mount San Antonio (Mt. Baldy), the creek flows southward through San Antonio Canyon. Flows are regulated by the San Antonio Dam, a flood control facility operated by the U.S. Army Corps of Engineers. Below the dam, the creek flows into the Six Basins and Chino Basin areas, where it is utilized for both direct supply and groundwater recharge.

3.3.2. Surface Water Diversions and Management

Unlike its role with imported water, TVMWD does not own surface water rights or operate self-supplied surface water diversion facilities to meet regional water demands. Instead, surface water rights are held and managed by specific retail member agencies and mutual water companies within the Region.

Key surface water management activities in the Region include:

- Covina Valley Water Company: Formed through the merger of the Covina Irrigating Company and Valencia Heights Water Company, CVWC is a TVMWD member agency that holds pre-1914 appropriative rights to divert surface water from the San Gabriel River. These surface water rights are legally administered and apportioned through CVWC's membership in the San Gabriel River Water Committee (historically known as the "Committee of Nine" established by the 1889 Compromise Agreement) (documentation of the pre-1914 rights are included in **Part 3, Appendix O**). CVWC treats this local surface water (along with untreated imported water from TVMWD) at its William B. Temple Treatment Plant before supplying it to member agencies within the TVMWD region. Based on historical data from 2015 to 2022, CVWC diverts an average of 1,135 AFY of local surface water from the San Gabriel River.
- City of Pomona: The City of Pomona holds pre-1914 appropriative rights (included in **Part 3, Appendix P**) to local surface water from San Antonio Creek and its local tributary watersheds (such as Evey Canyon). These surface water rights are shared with the San Antonio Water

Company via a diversion structure located upstream of the San Antonio Dam. Crucially, the 1998 Six Basins Adjudication Judgment explicitly reaffirmed the City of Pomona's right to continue harvesting this surface water for direct municipal use, independent of the basin's groundwater recharge obligations. The City diverts this water and treats it at the Pedley Filtration Plant, located in the City of Claremont, for potable use. Based on historical data from 2021 to 2025, Pomona diverts an average of 1,481 AFY of local surface water from the San Gabriel River.

- TVMWD Recharge Operations: While TVMWD does not directly serve surface water to customers, it actively participates in the management of these flows to maximize regional groundwater storage. For example, TVMWD purchases San Antonio Creek surface water supplies from the City of Pomona to replenish the Six Basins. TVMWD also utilizes interconnections, such as Pomona's Canon pipeline, to direct surface water to the San Antonio Spreading Grounds, directly benefiting TVMWD's groundwater extraction wells located in the Six Basins.

3.3.3. Surface Water Quality and Climate Impacts

Because the TVMWD service area straddles a major hydrological divide, surface water quality is governed by two separate regulatory frameworks:

- San Gabriel River Watershed: Governed by the SWRCB Plan for the Los Angeles Region (Region 4 Basin Plan) (LARWQCB, 2014).
- San Antonio Creek Watershed: Governed by the SWRCB Plan for the Santa Ana River Basin (Region 8 Basin Plan) (SARWQCB, 2025).

These Basin Plans establish the beneficial use designations and water quality objectives for the Region's surface waters. Because the Participating Agencies divert surface water from the high-elevation, upper portions of these watersheds (upstream of major urban development), the ambient water quality is generally excellent and free of the urban runoff contaminants, industrial discharges, and 303(d) impairments that typically affect the lower reaches of these river systems.

Source-Specific Quality and Treatment

While free of most industrial contaminants, local surface water is directly exposed to the natural environment and requires conventional treatment (coagulation, flocculation, sedimentation, filtration, and disinfection) to meet state and federal drinking water standards.

- San Gabriel River: Water diverted by the CVWC from the San Gabriel River is characterized by low TDS and high historical purity. CVWC treats this water at its William B. Temple Treatment Plant.
- San Antonio Creek: Water diverted by the City of Pomona from San Antonio Creek originates as mountain snowmelt and runoff from Mount San Antonio. It is treated at the City's Pedley Filtration Plant in Claremont.

The primary water quality challenge for both of these sources is turbidity (suspended sediment and organic matter) driven by weather events. During dry periods, the water is clear and easily treated. However, during intense winter storms, rapid runoff causes severe spikes in turbidity. When turbidity levels exceed the operational thresholds of the filtration plants, agencies are forced to temporarily halt diversions and bypass the storm flows until the water clears, resulting in a loss of potential supply. **Table 3-14** describes the primary surface water quality challenges and concerns in the Region.

Table 3-14. Primary Surface Water Quality Challenges and Operational Impacts

Water Quality Challenge	Primary Source / Cause	Impact on Supply Reliability	Typical Mitigation / Treatment Strategy
Turbidity (Suspended Solids)	Heavy winter rainstorms, rapid snowmelt	High Nephelometric Turbidity Unit (NTU) levels can blind filters; forces temporary shutdown of diversion facilities.	Conventional filtration; temporary bypass of high-flow storm events.
Total Organic Carbon (TOC)	Natural decay, post-wildfire ash	Acts as a precursor for DBPs when chlorinated.	Enhanced coagulation; careful management of chlorine dosing; blending with imported water.
Ash and Debris Loads	Post-wildfire runoff from the San Gabriel Mountains	Can physically damage intakes and severely degrade raw water quality for extended periods.	Watershed management; installation of protective intake screens; temporary reliance on groundwater/imported water.
Pathogens (Giardia, Cryptosporidium)	Wildlife and natural environmental exposure	Requires strict compliance with the Surface Water Treatment Rule.	Multi-barrier treatment (Filtration + UV or Chlorine disinfection).

Climate Change and Wildfire Impacts

Because local surface water supplies are directly tied to precipitation, they are highly vulnerable to the impacts of climate change. As discussed in **Section 2.5.2**, TVMWD's 2024 Climate Assessment modeled a "Dry Hot" (Drier with Extreme Warming) scenario against historical baselines (TVMWD, 2024a). As part of that Climate Assessment, projected changes in streamflow were modeled for the San Gabriel River

(specifically below Santa Fe Dam near Baldwin, USGS Gage 11085000) through the year 2045 (USGS, 2026).

The modeling revealed several critical vulnerabilities for the Region's surface water supplies:

- Reduction in Total Flow: Under the Dry Hot scenario, annual streamflow in the San Gabriel River is projected to decrease by 10 percent by 2045 relative to the current climate.
- Shift in Seasonal Timing: The hydrograph of the river is expected to shift significantly. Lower flows are projected during the historically high-flow months of February and March (decreasing by 20 to 21 cubic feet per second [cfs]), while precipitation shifts slightly earlier into the fall.
- Increased Intensity and Shorter Seasons: The Region is projected to experience a shorter overall rainy season, but with the potential for higher-intensity storm events. This results in higher peak flows of shorter duration.

These hydrologic shifts dictate that river supplies will become less reliable for direct diversion. While natural groundwater recharge will still occur, the shifting timing and increased intensity of storm flows mean that existing diversion facilities and spreading grounds may face capacity constraints during flash-flood events. Consequently, the Region must adapt its surface water management strategies to ensure diversion facilities can capture and recharge these higher-intensity, higher turbidity, and shorter-duration flows before they are lost downstream.

3.4. Stormwater

Within the TVMWD service area, other than the surface water described in the prior section, stormwater is not directly diverted for potable use; rather, stormwater capture is a component of the Region’s conjunctive use and groundwater management strategy. The capture and percolation of local stormwater runoff is the primary mechanism for the natural replenishment of the Main San Gabriel, Six Basins, Chino, and Spadra groundwater basins. The volume of stormwater captured directly influences the OSY of these adjudicated basins, which in turn supports the local groundwater extraction totals detailed in **Section 3.2.**

3.4.1. Regional Stormwater Capture Facilities

Because TVMWD is a wholesale agency, it does not own or operate stormwater capture or flood control infrastructure. Stormwater capture is managed through highly coordinated partnerships with regional flood control districts and local protective associations. These entities operate networks of dams, diversion structures, and spreading grounds designed to capture stormwater runoff and percolate it into the underlying aquifers.

Key stormwater capture facilities benefiting the Region include:

- Santa Fe Spreading Grounds (Main San Gabriel Basin): Operated by the Los Angeles County Department of Public Works (LACDPW), this facility captures runoff from the San Gabriel River watershed. Located in the upper portion of the Santa Fe Dam reservoir, the spreading grounds

utilize a rubber dam to direct river flows into percolation basins, capable of percolating approximately 400 cfs continuously.

- Peck Road Water Conservation Park (Main San Gabriel Basin): Operated by the LACDPW, this facility captures stormwater runoff from the San Gabriel River and Arcadia Wash watersheds. Functioning as both a recreational park and a critical water conservation asset, the facility utilizes a large primary lake and interconnected percolation basins to detain high-velocity storm flows. Impounding this water prevents it from bypassing the local groundwater system, instead allowing it to slowly infiltrate through highly permeable soils into the underlying Main San Gabriel Basin, actively supporting the Region's groundwater replenishment objectives.
- San Antonio and Thompson Creek Spreading Grounds (Six Basins / Chino Basin): Owned and managed by the Pomona Valley Protective Association (PVPA) in coordination with the U.S. Army Corps of Engineers and local Watermasters. Spanning approximately 1,000 acres, these facilities capture stormwater rushing out of San Antonio Canyon. Water impounded behind the San Antonio Dam is discharged in a controlled manner into PVPA diversion works, which utilize slide gates to divert high-velocity stormwater into gravel pits and channels for groundwater recharge.

Table 3-15 summarizes the primary stormwater capture and spreading facilities that support the Region’s groundwater basins.

Table 3-15. Major Stormwater Capture and Spreading Facilities Benefiting the Region

Facility Name	Managing/Operating Entity	Primary Source Water	Primary Basin(s) Recharged
Santa Fe Spreading Grounds	Los Angeles County Dept. of Public Works (LACDPW)	San Gabriel River	Main San Gabriel Basin
San Antonio Spreading Grounds	Pomona Valley Protective Association (PVPA) / USACE	San Antonio Creek	Six Basins, Chino Basin
Thompson Creek Spreading Grounds	PVPA / LACDPW	Thompson Creek	Six Basins
Peck Road Water Conservation Park	Los Angeles County Dept. of Public Works	San Gabriel River / Arcadia Wash	Main San Gabriel Basin

3.4.2. Climate Change Vulnerabilities and Planned Improvements

As described in the Region's Climate Change Vulnerability Assessment (Section 2.5), local hydrology is projected to shift (TVMWD, 2024a). While the total volume of annual precipitation may not decrease drastically by 2050, projections show that the timing and intensity of that precipitation will.

The Region is projected to experience a shorter rainy season characterized by more severe, high-intensity "atmospheric river" events. This volatility poses a direct threat to stormwater capture: existing diversion facilities and spreading grounds may face capacity constraints during flash-flood events, resulting in vital water supplies bypassing the spreading grounds and being lost to the ocean.

To mitigate this climate vulnerability, the Region is actively investing in infrastructure enhancements to increase the instantaneous capture capacity of local spreading grounds. These enhancements are described in more detail in **Section 3.9**.

3.5. Recycled Water and Wastewater

The development and utilization of recycled water is a critical strategy for the Region. Although implementing recycled water infrastructure requires significant capital investment, the supply is highly reliable because wastewater flows to treatment plants remain relatively constant regardless of hydrologic conditions. For this reason, recycled water is often considered a "drought-proof" supply.

Based on historical water use from 2021 to 2025, recycled water accounts for approximately 4 percent of the Region's total water supply portfolio, providing an average of 6,224 AFY. Currently, TVMWD does not directly use or have access to recycled water at the wholesale level. Instead, several member agencies within the TVMWD service area utilize recycled water to meet non-potable demands, primarily for landscape irrigation and industrial uses.

3.5.1. Wastewater Collection and Treatment

To understand the potential for recycled water, it is necessary to quantify the wastewater generated and treated within the Region. Neither TVMWD nor the majority of its Participating Agencies provide wastewater collection or treatment services. Instead, wastewater collection and treatment within the Region is primarily managed by LACSD, along with local municipal sewer departments that maintain the collection pipelines conveying wastewater to LACSD's trunk sewers.

Recycled water sources in the Region are primarily derived from two LACSD-owned and operated water reclamation plants (WRPs):

- Pomona WRP: Located within the City of Pomona, this facility treats wastewater generated by residential and commercial users in the eastern portion of the Region. The Pomona WRP provides primary, secondary, and tertiary treatment for a design capacity of 15 MGD.
- San Jose Creek WRP: Located adjacent to the City of Industry, this larger facility serves a broader area of the San Gabriel Valley. The San Jose Creek WRP consists of two hydraulically interconnected facilities (East and West) that provide primary, secondary, and tertiary treatment for a combined design capacity of 100 MGD.

Table 3-16 summarizes the existing wastewater collection and treatment facilities serving the Region.

Table 3-16. Wastewater Treatment Plants Serving the Region

Facility Name	Operating Agency	Treatment Level	Design Capacity (MGD)	2025 Average Daily Flow (MGD)	Effluent Use
Pomona WRP	LACSD	Tertiary	15	6.85	Non-potable reuse for irrigation; remaining discharged to San Jose Creek[1].
San Jose Creek WRP	LACSD	Tertiary	100	60.1[2]	Non-potable reuse; groundwater recharge; remaining discharged to San Gabriel River[3].

1. Under SWRCB Wastewater Change Petition WW0104 (SWRCB, 2020a) (included in **Part 3, Appendix Q**), LACSD is legally permitted to reduce its discharge to San Jose Creek to zero to maximize recycled water reuse, meaning there are no minimum bypass flow obligations for downstream habitat.
2. Source: Sewerage Service "Will Serve" Documentation. As published in recent regional CEQA filings (e.g., City of Irwindale Final IS/MND, January 2025) (City of Irwindale, 2025).
3. Under SWRCB Wastewater Change Petition WW0107 (SWRCB, 2020b) (included in **Part 3, Appendix R**), LACSD is authorized to significantly reduce discharges to expand regional reuse. However, this authorization is subject to specific, enforceable minimum flow conditions negotiated with the SWRCB and California Department of Fish and Wildlife (e.g., maintaining ~5 MGD at specific outfalls) to protect downstream habitat and public trust resources.

3.5.2. Current Recycled Water Uses

While TVMWD does not distribute recycled water, six member agencies within the Region – the City of Pomona, Rowland WD, WVWD, Cal Poly Pomona, Mt. SAC, and the City of Industry – currently utilize tertiary-treated recycled water purchased from LACSD to offset potable water demands. This water is distributed through dedicated "purple pipe" systems and is primarily used for irrigation of parks, golf courses, schools, and roadway medians. Recycled water from LACSD is acquired by the Participating Agencies through individual service agreements rather than formal adjudicated entitlements. The total available recycled water supply is governed by the treatment capacity of LACSD's two regional WRPs – the Pomona WRP (15 MGD capacity) and the San Jose Creek WRP (100 MGD capacity) – as documented in Section 3.5.1.

The City of Pomona, Rowland WD, and WVWD are the largest utilizers of recycled water among the Participating Agencies. Furthermore, institutional partners such as Cal Poly Pomona utilize significant volumes of recycled water for campus landscaping and agricultural operations.

Table 3-17 summarizes the aggregated historical recycled water use by TVMWD agencies over the 2021–2025 baseline period.

Table 3-17. Historical Annual Recycled Water Use by TVMWD Agencies (2021-2025)

Water Source / Agency	2021	2022	2023	2024	2025	5-Year Average
Participating Agencies	4,566	4,972	3,939	3,593	3,430	4,100
Other TVMWD Agencies*	2,126	2,126	2,126	2,126	2,126	2,126
Regional Total	6,692	7,098	6,065	5,719	5,556	6,226

*Note: To accurately reflect the total regional recycled water use, this table incorporates estimated recycled water use for Other Member Agencies within the TVMWD service area. Because these agencies are not formal signatories to this 2025 RUWMP, their historical recycled water use were estimated utilizing the best available public data, including related environmental documentation (e.g., EIRs) and 2020 UWMPs.

3.5.3. Planned Recycled Water Projects

The Region is actively exploring opportunities to expand the beneficial use of recycled water to further reduce dependence on imported water supplies. While expanding traditional "purple pipe" non-potable systems is ongoing, the Region is also investigating advanced purification and groundwater injection strategies. More detail is provided in **Section 3.9**.

3.6. Transfers and Exchanges

To maximize the reliability and efficiency of the Region's water supply, TVMWD and its Participating Agencies actively utilize transfers and exchanges. These water management strategies allow the Region to optimize existing resources, overcome localized water quality or infrastructure constraints, and ensure that water can be moved to where it is needed most, particularly during extended drought periods or emergency outages. While TVMWD serves as the primary conduit for importing water into the Region, the retail agencies themselves possess a highly interconnected distribution network. By leveraging joint powers authorities, shared pipelines, and cooperative agreements, the agencies can physically and contractually exchange water supplies.

Water transfers and exchanges involve the temporary or long-term trading of water rights or physical water supplies between agencies. In the TVMWD service area, these exchanges are facilitated by both physical interconnections and contractual agreements.

Existing Exchange Mechanisms and Infrastructure

A critical component of the Region's transfer capability is the Pomona-Walnut-Rowland JWL. The JWL is a shared transmission pipeline – not a standalone water right or active supply transfer program – that allows for the efficient movement of treated imported water (described in **Section 3.1**) among the City of Pomona, Rowland WD, and WVWD. While it does not currently generate 'new' supply, the JWL's physical interconnection makes future regional exchanges possible. For example, the planned Chino Basin Conjunctive Use Exchange (described in **Section 3.9**) relies entirely on the JWL to physically wheel Pomona's extracted groundwater westward to offset other agencies' imported water demands.

Additionally, the PBWA acts as a legal and administrative vehicle for executing water transfers, securing groundwater export rights, and developing shared infrastructure that benefits both districts. While the PBWA does not generate ‘new’ supply, it utilizes its authority to optimize regional reliability by banking

surplus water in the Main San Gabriel Basin (described in **Section 3.2.1**) and facilitate external surface water transfers, such as the planned partnership with the Covina Valley Water Company (described in **Section 3.9**).

In addition to these specific regional projects, TVMWD and the Participating Agencies continue to maintain emergency interties with neighboring systems to facilitate short-term transfers during facility outages or localized supply disruptions.

3.7. Supply From Storage

A foundational pillar of the Region's water supply reliability is the proactive management of local groundwater basins through "conjunctive use." Conjunctive use is the strategic practice of storing imported surface water in local groundwater aquifers during wet years when supplies are abundant, and subsequently extracting that stored water during dry years when imported supplies are constrained.

This regional "water banking" strategy acts as a critical buffer, allowing the Participating Agencies to maintain sufficient supply to meet demands during single-dry and multi-year drought conditions without triggering severe mandatory rationing.

It is important to note that 'Supply from Storage' is not quantified as an independent, separate line item in the regional supply projections presented in **Section 5**. Because the Region actively practices conjunctive use, the withdrawal of banked water is physically realized through increased local well production during droughts. Therefore, the yields from the storage accounts detailed in this section are implicitly embedded within the regional 'Local Groundwater' supply totals. Listing storage as a separate supply source would result in an inaccurate double-counting of the Region's available water assets.

3.7.1. TVMWD Regional Storage Capacity and MWD Cyclic Storage

TVMWD actively manages changes in annual water supply availability by utilizing storage accounts across multiple adjudicated basins. Across the Main San Gabriel, Six Basins, and Chino Basins, TVMWD has a combined authorized storage capacity of 54,890 AF.

A primary mechanism for utilizing this capacity is the Cyclic Storage Program established with MWD. Under this program, MWD delivers imported water supplies to TVMWD for storage in advance of demand. This allows the Region to capture surplus imported supplies that would otherwise be lost to the ocean during high-precipitation years. TVMWD's Cyclic Storage Agreement with MWD (included in **Part 3, Appendix K**) allows for the pre-delivery and storage of up to 50,000 AF. Originally signed in 1991, this agreement was recently amended and extended through June 2034, ensuring long-term contractual reliability for the Region's banking operations.

MWD Chino Basin Conjunctive Use Program (Dry-Year Yield Program)

In addition to cyclic storage accounts, TVMWD is a signatory partner in MWD's Chino Basin Conjunctive Use Program (regionally referred to as the Dry-Year Yield Program, or DYYP). Executed in June 2003 in partnership with MWD, the Inland Empire Utilities Agency (IEUA), and the Chino Basin Watermaster, this

program is one of the largest active groundwater banking operations in Southern California (MWD et al., 2003) (Agreement provided in **Part 3, Appendix T**).

The DYYP provides a maximum authorized storage capacity of 100,000 AF within the Chino Basin, with a designed dry-year extraction yield of up to 33,000 AF per year. Under this arrangement, MWD stores surplus imported water in the Chino Basin during hydrologically wet periods using Proposition 13 state grant funds and MWD capital.

During severe droughts or periods of imported supply constraint, MWD can "call" on this stored water. To execute the call, local participating pumpers extract the banked groundwater in lieu of taking treated imported water deliveries from MWD. This in-lieu exchange effectively frees up MWD's regional surface water supplies, reduces TVMWD's imported water demand during critical shortage years, and provides a highly reliable local buffer against SWP allocation cuts. Operating under an initial 25-year term (through 2028, with provisions for renewal or extension), the DYYP serves as a foundational component of the Region’s drought resilience strategy and illustrates the collaborative, conjunctive management required to navigate prolonged dry periods.

By the end of 2025, TVMWD is projected to hold approximately 11,000 AF of water in storage across its accounts. **Table 3-18** summarizes the Region's aggregated groundwater storage portfolio, delineating between wholesale accounts managed by TVMWD and retail accounts managed by Joint Power Authorities (such as PBWA).

Table 3-18. TVMWD Regional Groundwater Storage Portfolio Summary

Groundwater Basin	Agreement Type	Maximum Storage Capacity (AF)	Estimated Stored Balance (End of 2025) (AF)
Wholesale Storage			
Main San Gabriel Basin	Cyclic Storage Agreement	50,000	3,079
Six Basins	Operational Storage Account	3,500	~3,500[1]
Chino Basin	One-Time Storage Agreement	1,390	1,390
Spadra Basin	Planned Optimization Project	0 (Planned: 3,500)	0
Wholesale Subtotal		54,890 (Current) 58,390 (Current and Planned)	~7,969
Retail / JPA Storage			
Main San Gabriel Basin	Storage and Export Agreement	30,000	3,000[2]
Retail / JPA Subtotal		30,000	3,000
Regional Total		**84,890 (Current)** **88,390 (Current and Planned)**	**~10,969**
MWD Regional Storage (Partnered)			
Chino Basin	MWD Conjunctive Use Program (DYYP)	100,000 (shared with IEUA)[4]	Managed by MWD[3]

1. Based on 2024 Annual Watermaster Report (Six Basins Watermaster, 2025). Final 2025 stored balances are subject to ongoing Six Basins Watermaster reconciliation.
2. Balance estimated based on the PBWA Board of Commissioners' October 2024 authorization to purchase 3,000 AF of cyclic storage for the 2025-2029 water years (PBWA, 2024b).
3. The 100,000 AF maximum capacity represents a regional MWD account shared with the IEUA. Because the stored water is owned by MWD and called at MWD's discretion, the current stored balance is excluded from TVMWD's exclusive local storage totals to accurately reflect local asset control and avoid double-counting MWD supplies.

Groundwater banking programs are a formalized extension of the Region's conjunctive use strategy. While general groundwater storage involves recharging the aquifer to maintain basin health, "banking" involves formal, contractual agreements that allow an agency to deposit a quantified volume of water into a basin and retain the legal right to extract, transfer, or export that specific volume of water at a later date.

Because the Region overlies multiple adjudicated and managed basins, groundwater banking requires close coordination with basin Watermasters to ensure that deposits and withdrawals do not negatively impact basin safe yields or water quality.

3.7.2. Recharge Mechanisms and Operational Constraints

To physically place water into these groundwater storage accounts, TVMWD purchases untreated imported water from MWD and delivers it to various regional spreading grounds, such as the San Antonio Spreading Grounds (Six Basins) and the Santa Fe Spreading Grounds (Main San Gabriel Basin). Water is also banked "in-lieu" by providing treated surface water to retail agencies, allowing them to turn off their groundwater pumps and leave their groundwater rights in the aquifer.

While TVMWD possesses significant "paper" storage capacity, the physical availability of spreading facilities and conveyance pipelines can limit the ability to fully utilize these programs. During extreme wet years, spreading grounds must be shared with local flood control and stormwater capture operations, occasionally limiting the volume of imported water that can be recharged simultaneously.

Planned Groundwater Mitigation Projects

To overcome these operational constraints and maximize the Region's conjunctive use potential, TVMWD and its member agencies have identified a suite of regional mitigation projects focused on expanding treatment capacity, installing new extraction and injection wells, and building interties to move stored water across the Region more effectively. These projects are described in more detail in **Section 3.9**.

3.8. Desalination Opportunities

The CWC requires urban water suppliers to evaluate the opportunities for the development of desalinated water, including ocean water, brackish surface water, and brackish groundwater, as a long-term supply. Desalination involves treating water with high salinity levels – typically using advanced membrane processes such as reverse osmosis (RO) – to produce potable drinking water.

3.8.1. Opportunities for Brackish Water and/or Groundwater Desalination

Brackish groundwater refers to groundwater with elevated levels of TDS and salts, often resulting from historical agricultural practices or localized geological conditions.

Currently, the primary groundwater quality constraints within the Region are related to VOCs, nitrates, and CECs such as PFAS. Participating Agencies are actively investing in advanced water treatment infrastructure – including ion exchange and RO trains, such as the additions planned at the Cal Poly Pomona Water Treatment Plant – to address these specific contaminants.

While RO technology is capable of desalting brackish water, large-scale brackish groundwater desalination specifically for the purpose of salt removal is not currently a primary supply development strategy for the TVMWD service area. However, as regional salt and nutrient management plans continue to monitor TDS accumulation in shared basins like the Chino Basin, the deployment of desalter operations may become a more prominent opportunity in the future. At this time, the Region focuses its groundwater recovery investments on addressing industrial and chemical contaminants to restore stranded well assets rather than brackish desalting.

3.8.2. Opportunities for Seawater Desalination

Because the TVMWD service area is located in inland eastern Los Angeles County, it is geographically landlocked. Therefore, the direct development of seawater desalination facilities within the Region is physically and economically infeasible.

However, the Region recognizes and supports seawater desalination as a vital component of Southern California's overall water supply reliability. MWD actively supports the development of seawater desalination by its coastal member agencies through the Local Resources Program (LRP). When coastal agencies develop local desalinated supplies, it offsets their demand for imported water from the SWP and the Colorado River. This reduction in coastal demand directly benefits inland agencies like TVMWD by increasing the availability and reliability of imported water in MWD's regional storage network. Consequently, while TVMWD will not construct seawater desalination facilities, it indirectly relies on regional desalination advancements to bolster its imported water reliability.

3.9. Planned Water Supply Projects and Programs

As detailed throughout this chapter, the TVMWD service area relies on a complex, interconnected portfolio of imported and local water supplies. However, escalating climate change impacts – such as hydrologic volatility, prolonged droughts, and reduced imported water reliability – combined with increasingly stringent water quality regulations (e.g., new MCLs for PFAS), threaten the historical yield and flexibility of these resources.

To proactively mitigate these vulnerabilities and ensure long-term regional water security, TVMWD and its Participating Agencies have identified a suite of collaborative water supply projects and programs that focus on optimizing existing infrastructure, remediating stranded groundwater assets, expanding conjunctive use storage, and maximizing the physical capture and treatment of available local supplies. The key planned regional projects, which are at various stages of evaluation, design, and implementation, are detailed in TVMWD's 2025 WRMP (**Part 3, Appendix H**). These projects include:

Project 1: External Partnership with CVWC (formerly CIC) (Main Basin)

Through the Puente Basin Water Agency (described in **Section 3.2.1**), the Region is pursuing an external partnership with CVWC to access existing surplus water supplies. This project involves the construction of a new pipeline intertie that will allow the pumping of surplus CVWC well and surface water from the Main San Gabriel Basin directly into the Badillo-Grand pipeline. By physically importing this surplus local water eastward, the intertie is estimated to provide up to 2,000 AFY of supply, directly offsetting the participating agencies' reliance on TVMWD imported water deliveries.

Project 2: TVMWD Groundwater Reliability Improvement Program (GRIP)

This regional project would include a TVMWD partnership with the City of Glendora and the Puente Basin Water Agency to implement a regional distribution network and local supplies by utilizing 9,000 AF/year of stranded city assets. The regional distribution network would be augmented by the construction of new treatment facilities and conveyance pipelines. Three Valleys, as the lead agency, will

develop the project that includes new replacement wells with wellhead treatment for City of Glendora's Wells #3, 4, and 7, and the pipeline and pumpstations. This regional project could also be expanded to address water quality concerns for more member agencies. This project would increase regional water supply reliability, thereby improving operational flexibility by integrating additional water sources into the existing network. This regional project would provide an estimated 9 TAF toward Three Valleys' goal of increasing overall water supply by 15 TAF.

Project 3: TVMWD Storing Water in Main San Gabriel Basin (GRIP+)

This project represents a major regional partnership between TVMWD, the City of Glendora, and the City of Pomona to maximize the storage of surplus imported water during wet years at the Santa Fe Spreading Grounds. To ensure this stored water can be efficiently recovered and distributed during droughts, the project expands physical extraction and conveyance capacity. Infrastructure plans include the installation of five new extraction wells (two dedicated to Glendora and three to Pomona) equipped with necessary wellhead treatments. Additionally, the project will construct approximately five miles of potable water pipeline to connect these Main San Gabriel Basin supplies directly to Pomona's distribution system and the Pomona-Walnut-Rowland JWL. Once fully implemented, this project is anticipated to produce approximately 9,200 AFY of highly reliable local groundwater supply.

Project 4: TVMWD-Pomona Chino Basin Conjunctive Use Exchange

Building upon the Region's successful participation in the existing MWD Dry-Year Yield Program detailed in **Section 3.7.1**, TVMWD and the City of Pomona are actively evaluating a mutually beneficial "in-lieu" exchange program to leverage the Chino Basin. While the MWD DYYP provides a broad regional buffer for the State Water Project, this planned TVMWD partnership focuses on highly localized infrastructure optimizations. Under this arrangement, TVMWD would provide funding to construct or upgrade Pomona's extraction and treatment infrastructure in the Chino Basin. In exchange, Pomona would pump and deliver an equivalent amount of its local water for use by other TVMWD member agencies. This exchanged water would be conveyed westward via the JWL and the Badillo/Grand Transmission Main. This creates a highly reliable local groundwater source for agencies that currently possess high dependencies on imported water (such as the City of La Verne, Golden State Water Company, and the Puente Basin Water Agency).

Other planned regional efforts and projects include:

Spadra Basin Optimization & Cal Poly Pomona Injection

This initiative combines multiple concepts to revitalize the non-adjudicated Spadra Basin using advanced treated recycled water. Spearheaded collaboratively by Walnut Valley Water District, the City of Pomona, and California State Polytechnic University, Pomona (Cal Poly), the optimization project proposes the construction of an underground recharge gallery, seven injection wells, five production wells, and the expansion of the Cal Poly Reverse Osmosis (RO) plant. A key component involves utilizing TVMWD's Corporate Center Drive properties (adjacent to the I-57 and I-71 freeways) for new injection and extraction wells. By partnering with the Los Angeles County Sanitation Districts to secure advanced treated recycled water for injection, this project aims to create a drought-proof local storage asset with a capacity of up to 3,500 AF.

Stormwater Capture Enhancements

To address the climate-driven shift toward shorter, higher-intensity winter storm events, the Region is upgrading its local spreading grounds to prevent volatile flash-flood flows from bypassing capture facilities. At the San Antonio Spreading Grounds, plans include excavating and developing new, deeper recharge basins (up to 200 feet in depth) to drastically increase instantaneous stormwater capture and storage volume. Concurrently, at the Thompson Creek Spreading Grounds, the Region is working in cooperation with the Los Angeles County Department of Public Works (LACDPW) to upgrade aging conveyance ditches and diversion structures to maximize the flow rate of water safely directed into the spreading basins.

4. Regional Water Use

Accurately projecting regional water use is a critical component of water supply planning. Within the TVMWD service area, historical water demands have been heavily influenced by population growth, climate variability, and diverse land uses ranging from dense urban centers to large institutional campuses. However, as the Region looks toward 2050, water use trends are undergoing a significant transformation. Despite anticipated modest population and economic growth, overall regional water demands are projected to decline. This downward shift is driven by a strong local commitment to water use efficiency and the implementation of stringent new state conservation mandates.

This chapter provides a comprehensive overview of water demands across the Region. It details the aggregated historical and projected water use for the Participating Agencies and the Other Member Agencies. Furthermore, this chapter outlines the Region's successful compliance with past SB X7-7 targets and describes the transition to the new "Making Conservation a California Way of Life" (CWOL) regulatory framework, including the development of specific Urban Water Use Objectives (UWUOs). Finally, it highlights the robust portfolio of regional and local Demand Management Measures (DMMs) and public outreach programs that the agencies are actively deploying to achieve these long-term efficiency goals.

4.1. Total Water Demands by Agency

As shown in **Table 4-1**, despite some continued growth due to infill and redevelopment, the total projected demand in the Region is expected to decline over time through 2050. This is due to implementation of the State's new "Making Conservation a California Way of Life Regulation" (CWOL Regulation), which is discussed further in **Section 4.2.2**. To comply with the CWOL Regulation, it is anticipated that all the Participating Agencies will need to reduce their water demands relative to 2017 to 2021 demands. The reductions vary by agency and range from 9% (City of Pomona and GSWC – Claremont) to 37% (City of Glendora). This estimated reduction is based on the actual customer base in 2017-2021 so it does not account for demand increases from future growth. It is generally assumed that new growth will comply with water use efficiency standards due to current building codes.

Table 4-1. Projected Total Annual Retail Water Demand (RUWMP Participating Agencies) (Acre-Feet)

Agency	2030	2035	2040	2045	2050
City of Glendora	10,004	9,878	9,696	9,517	9,342
City of La Verne	6,352	6,340	6,301	6,263	6,228
City of Pomona	20,147	20,116	19,917	19,719	19,521
GSWC – Claremont	9,873	9,603	9,262	8,941	8,644
GSWC – San Dimas	9,713	10,000	9,970	9,937	9,903
Rowland Water District	10,267	10,004	9,777	9,584	9,421
Walnut Valley Water District	16,369	15,246	14,559	14,580	14,589
Projected Total Demand	**82,725**	**81,187**	**79,482**	**78,541**	**77,648**

4.2. Water Use Efficiency

The Region has invested in expanding and optimizing local water resources to reduce reliance on imported supplies and maintain cost stability for its customers. At the same time, the Region continues to advance water use efficiency and conservation programs that have meaningfully reduced per capita demand and strengthened long-term supply reliability. These conservation efforts are a core component of the Region's resource management strategy and help maximize the value of available supplies.

4.2.1. SB X7-7 Compliance

Senate Bill 7 of Special Extended Session 7 (SBX7-7) was incorporated into the UWMP Act in 2009 and requires that all water suppliers increase water use efficiency with the overall goal to decrease per capita water consumption within the state by 20 percent by the year 2020. SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, 2016) specify methodologies for determining the baseline water demand, 2015 interim urban water use target, and the 2020 urban water use target for Western, as described in detail in the Participating Agencies' 2020 UWMPs. All of the Participating Agencies met their targets to reduce per capita water consumption by 20 percent by 2020. For final verification in the 2025 UWMP, **Section 3** of each retail agency chapter in **Part 2** also demonstrates that the suppliers met its 2020 target.

4.2.2. New Water Conservation Legislation

Going forward, Participating Agencies that are retail suppliers are continuing to align with new water use efficiency standards from the CWOL Regulation, which supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the "2018 Water Conservation Legislation." Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation (SWRCB, 2024), each urban retail water supplier must calculate and comply with its specific Urban Water Use Objective (UWUO), with efficiency standards becoming increasingly stringent through 2040. DWR and the SWRCB have developed a reporting framework for calculating the UWUO and compliance annually. The UWUO is composed of several standards to create one comprehensive objective, as shown in **Figure 4-1**.

Figure 4-1. Urban Water Use Objectives Regulation Overview



Indoor Residential

The indoor residential water use standard was set as part of Senate Bill (SB) 1157, which adopts recommendations made by DWR and the State Water Board to reduce indoor water use targets from 55 gallons per capita per day (gpcd) to 47 gpcd by 2025 and 42 gpcd by 2030.

Outdoor Residential

Outdoor residential use is expected to be based on the amount of irrigable area and an increasingly stringent landscape efficiency factor with compliance progress measured annually through 2035, when the efficiency factor is proposed to remain constant. The SWRCB assists agencies in calculating outdoor residential use budgets by providing aerial imagery that delineates irrigable irrigated, irrigable but not irrigated, and non-irrigable areas. This data has been provided to suppliers and is expected to be updated in five-year cycles.

Commercial, Industrial, and Institutional Landscape

Commercial, industrial, and institutional (CII) standards will be based on total gallons used and will require implementation of dedicated irrigation meters or in-lieu technologies, and other performance measures for conservation. Additionally, CII customer accounts will need to be classified into specific and general categories for reporting and compliance over the course of several years yet to be determined by the State.

Water Loss

The water loss component of the UWUO is a standalone component that must be met on its own beginning in 2028. **Section 2.1.3** of each retail agency chapter in **Part 2** describes the water loss standard and the agency's progress toward meeting it.

Additionally, each urban retail water supplier must submit an Annual Water Use Report (AWUR) starting January 1, 2024 to document progress toward complying with the UWUO regulations.

As discussed in **Section 2.2** of each retail agency chapter in **Part 2**, some Participating Agencies in this RUWMP elected to incorporate the conservation that would be required to meet the UWUO into the future demand projections directly and some elected to assume less conservation than would be required to meet the UWUO for the purpose of more conservative supply planning. The required calculations and reporting associated with the CWOL Regulations are complex and extensive and are therefore not required to be included in the UWMP.

4.2.3. Regional Demand Management Programs

TVMWD retail agencies have adopted water waste prevention ordinances, universal metering, tiered conservation pricing, and robust public education and outreach programs, as described in Section 8 of each retail agency chapter in **Part 2**. Common measures include active leak detection, annual water loss audits, and dedicated conservation staffing to support program implementation. All seven retail agencies participate in one or more components of MWD's regional rebate program: SoCal Water$mart.

This program includes rebates for high efficiency indoor fixtures, irrigation devices, and turf removal. Other programs offered by retailers, or through participation with MWD, include water use efficiency surveys and leak repair programs.

Retail agencies have also launched unique and innovative efforts. La Verne provides video-based water-wise landscaping training classes that teaches how to use rainwater as a resource and manage irrigation in backyards. Walnut Valley installed Hydrant Guard check valves, which aim to reduce catastrophic water loss associated with broken fire hydrants. Rowland WD offers multi-tiered school and youth education programs. Rowland WD and Glendora have each deployed advanced metering systems with customer leak alerts and usage analytics. Pomona participates in, or hosts, more than a dozen events throughout the year including the “Water is Life” art poster and essay contest. Pomona also has a Water Watcher reporting line (online and via phone) for reporting visible leaks or excess runoff.

These regional and local programs work together to support the Region’s strategy to reduce demand, improve efficiency, reduce water loss, and reinforce conservation as California way of life.

5. Comparison of Regional Supplies and Demands

The continuous and reliable provision of potable water is the foundational mandate of urban water suppliers. In accordance with California Water Code § 10635(a), every urban water supplier must assess the reliability of its water service by comparing total projected water use with the projected water supply over a planning horizon of at least 20 years.

This chapter provides that core statutory assessment for the TVMWD service area as a whole, extending the planning horizon out to 2050 to ensure robust long-term resiliency. The analysis rigorously stress-tests the Region's water portfolio under varying hydrological conditions, specifically encompassing a Normal Water Year, a Single Dry Year, a drought scenario lasting Five Consecutive Water Years, and a highly conservative Twenty-Year Drought scenario.

To navigate the complexities of shared imported water aqueducts and interconnected groundwater aquifers, this chapter synthesizes supply and demand data gathered from across the entire 133-square-mile TVMWD service area. As established in **Section 1**, the aggregated "Regional Context" analysis meticulously integrates projections for both the seven Participating Agencies and the Other Member Agencies. By systematically incorporating all entities that draw upon the Region's shared infrastructure, the ensuing analysis provides a highly accurate, bottom-up aggregation of the regional water balance. The water service reliability assessment for each of the Participating agencies individually is presented in **Chapter 5** of the respective chapters in **Part 2**.

5.1. Supply and Demand Projections Methodology

Evaluating water supply reliability through the year 2050 requires sophisticated forecasting methodologies that account for complex demographic shifts, the escalating impacts of climate change, evolving regulatory constraints, and behavioral modifications in urban water consumption. The analytical framework developed for this 2025 RUWMP utilizes ground-truthed projections and operationally conservative supply capability assessments to rigorously test the Region's overall water portfolio.

5.1.1. Demand Projections

The demand projections utilized in this comparison (detailed in **Chapter 4**) were generated using a multi-scenario analytical approach. Recognizing that a single, flat population growth multiplier is insufficient for modern water planning, distinct demand projection methodologies were developed for each agency. These dynamic scenarios ranged from baseline trend continuations to aggressive conservation scenarios modeled to ensure statutory compliance with the new CWOL Regulation.

Through collaborative working sessions, each participating agency selected the specific methodology most representative of its local service area dynamics, accounting for factors such as high-density infill development, the prevalence of Accessory Dwelling Units (ADUs), and historical per capita usage trends. Crucially, the finalized demand projections incorporate both "Passive Conservation" (savings achieved

organically through the natural replacement of older plumbing fixtures per California building codes) and "Active Conservation" (savings derived from agency-sponsored rebate initiatives and turf-removal programs). Detailed explanations of the demand projection methodology used for each of the Participating Agencies are included in **Section 2.2** of each agency chapter in **Part 2**.

5.1.2. Supply Projections

Water supply reliability planning frequently grapples with the discrepancy between contractual water rights (theoretical capacity) and actual, physical water availability (operational reality). To systematically address potential differences, the analytical framework for the 2025 RUWMP evaluated two distinct methodologies for projecting future local water supply: the "Paper Water" approach and the "Real Water" approach.

- **Option 1:** The "Real Water" Approach (Utilization-Based): This approach is grounded strictly in empirical operational data. Under this framework, the baseline local agency supplies are tied directly to the actual historical averages extracted and utilized between the years 2021 and 2025. This period provides a good representation of hydrologic variations because it includes the severe, critically dry conditions of 2021–2022, the exceptionally wet hydrology of 2023, and the transitional conditions of 2024-2025. This period also reflects the most recent operational constraints that impact supply availability. By capturing recent shifts in groundwater availability – specifically, extraction wells taken offline or restricted due to newly implemented PFAS and CEC water quality regulations – this baseline ensures the supply projections reflect current physical reality rather than outdated infrastructure capacities.
- **Option 2:** The "Paper Water" Approach (Capacity-Based): This approach projects future supply based on the maximum legal rights or absolute physical extraction capacity an agency holds within a basin. While useful for demonstrating legal entitlements and maximum potential supply, this approach can inadvertently mask critical infrastructure bottlenecks or localized water quality constraints (such as expanding contaminant plumes) that prevent an agency from accessing its full theoretical allocation.

To ensure the most conservative, defensible, and operationally realistic stress-test possible, the Participating Agencies unanimously selected the "Real Water" approach for their primary supply projections in this 2025 RUWMP. Once this empirical 2021–2025 baseline was established, specific climate change factors – derived from TVMWD's 2024 Climate Assessment (TVMWD, 2024a; provided in **Part 3, Appendix I**) and updated through 2025 for these analyses – were applied to project the degradation, volatility, or shift in local supply availability through 2050. Any projected unmet demand remaining after these adjusted local supplies are exhausted is assumed to be met by imported water supply deliveries from TVMWD and MWD.

Detailed explanations of the supply projection methodology used for each of the Participating Agencies are included in **Section 4** of each agency chapter in **Part 2**.

5.2. Summary of Regional Supplies and Demands

The core statutory requirement of the UWMP is the direct comparison of total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments. This assessment determines if the Region possesses the physical, contractual, and infrastructural capacity to support its population through 2050 under varying climatic stressors.

Because the Participating Agencies selected the "Real Water" (Utilization-Based) methodology for this analysis, projected supplies are managed conjunctively to meet projected demands. Any localized deficits in groundwater or surface water are met by imported water deliveries from TVMWD and MWD.

To understand the supply and demand comparisons in the following sections, it is critical to understand how the Region's water portfolio changes under hydrological stress.

A key trend in Southern California urban water management is that during dry years, water demand typically increases. Hotter baseline temperatures and a lack of natural precipitation drive residents and institutional campuses to increase outdoor irrigation to maintain landscaping. To meet this increased demand, the retail agencies adapt their operations. Some agencies ramp up extraction from local groundwater wells (drawing upon cyclical storage accounts), and agencies heavily reliant on imported water lean more on TVMWD to supply imported water from MWD.

As discussed in **Section 3.2.1**, Metropolitan's 2025 UWMP projects 100 percent imported water supply reliability under normal year, single dry year and 5 consecutive dry year scenarios and that conclusion is incorporated into this analysis (MWD, 2026b).

5.2.1. Normal Year

A "Normal Year" assessment evaluates the system under average climate conditions and standard baseline water yields. For this 2025 RUWMP, the Normal Year is defined by the average historical hydrology and usage patterns observed over the 2021–2025 baseline period. It is important to note that this specific five-year baseline applies exclusively to the Region's local supplies and retail demands; projected imported water availability relies on MWD's independent 2025 UWMP reliability modeling, which utilizes its own distinct, long-term historical baselines.

To accurately forecast reliability through 2050, the long-term climate change factors derived from the Region's 2024 Climate Assessment (described in **Section 2.5.2**) were applied to these baseline local supplies (described in **Section 3**) to account for projected warming, increased evapotranspiration, and shifting precipitation patterns. Additionally, the aggregated Normal Year demand projections incorporate anticipated demographic growth (described in **Section 2.3**) and the strict, mandatory active and passive conservation targets required by the new CWOL Regulations (described in **Section 4**).

Based on this thorough analysis, the TVMWD RUWMP Participating Agencies and entire service area exhibit total supply reliability through the year 2050. **Table 5-1** and **Table 5-2** detail the Normal Year

Supply and Demand comparison in five-year increments through 2050 for the specific Participating Agencies and the entire TVMWD service area, respectively.

Table 5-1. Normal Year Supply and Demand (RUWMP Participating Agencies) (Acre-Feet)

Category	2030	2035	2040	2045	2050
Local Groundwater	**31,495**	**32,173**	**31,697**	**31,046**	**30,225**
City of Glendora	9,090	9,018	8,864	8,642	8,357
City of La Verne	1,849	1,834	1,803	1,758	1,700
City of Pomona	13,266	13,160	12,936	12,612	12,196
GSWC - Claremont	4,593	4,534	4,493	4,456	4,420
GSWC - San Dimas	1,996	1,970	1,952	1,937	1,921
Rowland Water District	700	1,657	1,649	1,641	1,633
Recycled Water[1]	**5,058**	**5,132**	**5,191**	**5,234**	**5,263**
City of Pomona	1,874	1,874	1,874	1,874	1,874
Rowland Water District	1,033	1,127	1,219	1,309	1,396
Walnut Valley Water District	2,152	2,131	2,098	2,051	1,993
Surface Water	**1,691**	**1,674**	**1,649**	**1,616**	**1,576**
City of Pomona	1,691	1,674	1,649	1,616	1,576
Imported Water (TVMWD/MWD)	**41,991**	**37,199**	**35,956**	**35,684**	**35,658**
City of Glendora	906	853	825	867	977
City of La Verne	4,503	4,506	4,498	4,505	4,528
City of Pomona	3,315	3,408	3,458	3,617	3,876
GSWC - Claremont	5,280	5,069	4,769	4,485	4,224
GSWC - San Dimas	7,036	7,321	7,310	7,294	7,278
Rowland Water District	7,433	6,128	5,836	5,588	5,380
Walnut Valley Water District	13,518	9,915	9,261	9,329	9,396
Imported Water (Other)[2]	**2,491**	**5,009**	**4,988**	**4,960**	**4,926**
City of Glendora	8	8	7	8	9
GSWC - San Dimas	682	709	707	706	705
Rowland Water District	1,101	1,092	1,073	1,047	1,012
Walnut Valley Water District	700	3,200	3,200	3,200	3,200
Projected Total Supply	**82,726**	**81,187**	**79,481**	**78,541**	**77,648**
City of Glendora	10,004	9,878	9,696	9,517	9,342
City of La Verne	6,352	6,340	6,301	6,263	6,228
City of Pomona	20,147	20,116	19,917	19,719	19,521
GSWC - Claremont	9,873	9,603	9,262	8,941	8,644
GSWC - San Dimas	9,714	10,000	9,969	9,937	9,904
Rowland Water District	10,267	10,004	9,777	9,584	9,421
Walnut Valley Water District	16,369	15,246	14,559	14,580	14,589
Projected Total Demand	**82,726**	**81,187**	**79,481**	**78,541**	**77,648**

1. To accurately reflect the separation of the Region's potable and non-potable distribution systems, it is assumed that projected Recycled Water supply strictly equals Recycled Water demand for non-potable uses. All other water supplies listed in this table are utilized exclusively to meet potable demands. There is no crossover of non-potable supplies to meet potable demands.

2. This category represents water supplies purchased, transferred, or imported from entities other than TVMWD/MWD (described in **Section 3.1.4**).

Table 5-2. Normal Year Supply and Demand (Regional Total – All Agencies) (Acre-Feet)

Category	2030	2035	2040	2045	2050
Local Groundwater	65,872	66,550	66,074	65,448	64,627
Recycled Water[1]	7,688	7,762	7,821	7,864	7,893
Surface Water	2,541	2,524	2,499	2,466	2,426
Imported Water (TVMWD/MWD)	60,832	56,210	54,998	54,755	54,729
Imported Water (Other)[2]	16,239	18,756	18,735	18,708	18,673
Projected Total Supply	**153,172**	**151,803**	**150,127**	**149,241**	**148,348**
Projected Total Demand	**153,172**	**151,803**	**150,127**	**149,241**	**148,348**

1. To accurately reflect the separation of the Region's potable and non-potable distribution systems, it is assumed that projected Recycled Water supply strictly equals Recycled Water demand for non-potable uses. All other water supplies listed in this table are utilized exclusively to meet potable demands. There is no crossover of non-potable supplies to meet potable demands.
2. This category represents water supplies purchased, transferred, or imported from entities other than TVMWD/MWD (described in **Section 3.1.4**).

5.2.2. Single Dry Year

A "Single Dry Year" assessment models the reliability of the system under acute, short-term hydrological stress. To accurately model this scenario and predict future behavior, the analysis utilizes empirical data from the 2021 fiscal year, which represents a severe, comprehensively documented dry-year condition within the Region.

Based on TVMWD's operational data, the historical average year baseline was established using the five-year period of 2021–2025. During dry years, hotter temperatures and a lack of rainfall typically drive increased outdoor irrigation, resulting in higher overall water demand. To project future drought demands, historical peaking factors were calculated and applied to the projected normal year demands:

- RUWMP Participating Agencies: The ratio of water utilized by the seven Participating Agencies during 2021 (94,504 AF) to their historical average (83,031 AF) yielded a higher scaling factor of 114 percent.
- Regional Total (All Agencies): The ratio of water utilized by all 13 agencies during the historical single dry year of 2021 (156,297 AF) to the historical average (144,907 AF) yielded a scaling factor of 108 percent.

These respective scaling factors (114% and 108%) were applied to the projected normal year demands to forecast the elevated water demands during future single dry years. As shown in **Table 5-3** and **Table 5-4**, the Region possesses the physical and contractual capacity to completely fulfill these elevated demands, indicating total reliability during all future Single Dry Year events modeled through 2050.

Table 5-3. Single Dry Year Supply and Demand (RUWMP Participating Agencies) (Acre-Feet)

Category	2030	2035	2040	2045	2050
Local Groundwater	35,847	36,619	36,077	35,336	34,402
Recycled Water[1]	5,757	5,841	5,908	5,957	5,990
Surface Water	1,925	1,906	1,877	1,839	1,793
Imported Water (TVMWD/MWD)	47,793	42,339	40,925	40,615	40,586
Imported Water (Other)[2]	2,835	5,701	5,677	5,646	5,606
Projected Total Supply	**94,157**	**92,406**	**90,464**	**89,393**	**88,377**
Projected Total Demand	**94,157**	**92,406**	**90,464**	**89,393**	**88,377**

1. To accurately reflect the separation of the Region's potable and non-potable distribution systems, it is assumed that projected Recycled Water supply strictly equals Recycled Water demand for non-potable uses. All other water supplies listed in this table are utilized exclusively to meet potable demands. There is no crossover of non-potable supplies to meet potable demands.
2. This category represents water supplies purchased, transferred, or imported from entities other than TVMWD/MWD (described in **Section 3.1.4**).

Table 5-4. Single Dry Year Supply and Demand (Regional Total – All Agencies) (Acre-Feet)

Category	2030	2035	2040	2045	2050
Local Groundwater	71,050	71,781	71,267	70,592	69,707
Recycled Water[1]	8,292	8,372	8,436	8,482	8,513
Surface Water	2,741	2,723	2,696	2,660	2,616
Imported Water (TVMWD/MWD)	65,614	60,629	59,321	59,059	59,031
Imported Water (Other)[2]	17,515	20,231	20,208	20,178	20,141
Projected Total Supply	**165,212**	**163,736**	**161,928**	**160,972**	**160,009**
Projected Total Demand	**165,212**	**163,736**	**161,928**	**160,972**	**160,009**

3. To accurately reflect the separation of the Region's potable and non-potable distribution systems, it is assumed that projected Recycled Water supply strictly equals Recycled Water demand for non-potable uses. All other water supplies listed in this table are utilized exclusively to meet potable demands. There is no crossover of non-potable supplies to meet potable demands.
4. This category represents water supplies purchased, transferred, or imported from entities other than TVMWD/MWD (described in **Section 3.1.4**).

5.2.3. Five-Consecutive Dry Year and Drought Risk (2026-2030) Assessments

In accordance with California Water Code Section 10635(b), the evaluation of a drought lasting five consecutive water years serves as the Region's statutory Drought Risk Assessment (DRA). This assessment verifies the near-term resiliency of the Region's cyclic storage mechanisms and wholesale contracts by stress-testing the limits of aquifer drawdown and reservoir depletion over the immediate five-year planning horizon (2026 through 2030).

To estimate demands during a five-consecutive-year drought, the Region utilized the historical drought sequence from 2018 through 2022. The ratio of water utilized in each of these years was compared to the 2021-2025 historical average to yield specific annual scaling factors.

- RUWMP Participating Agencies: The historical water demand sequence yielded scaling factors of 112 percent, 102 percent, 107 percent, 114 percent, and 107 percent for years one through five.
- Regional Total (All Agencies): The historical water demand sequence yielded scaling factors of 112 percent, 102 percent, 107 percent, 108 percent, and 104 percent for years one through five of the drought, respectively.

These sequences of scaling factors were applied to the projected normal year demands to forecast the fluctuating, but consistently elevated, demands of a multi-year drought.

As shown in **Table 5-5** and **Table 5-6**, because the Region's groundwater basins are managed holistically using OSY, agencies are legally and physically permitted to intentionally draw down aquifer levels during a prolonged five-year drought starting in 2026, balancing the overdraft with replenishment during subsequent wet years. Consequently, backed by MWD's surface reservoirs and local groundwater banks, the Region projects sufficient supply capacity to meet these scaled demands across a five-year drought horizon through 2030.

Table 5-5. Regional Drought Risk Assessment (2026-2030) Supply and Demand by Source (RUWMP Participating Agencies) (Acre-Feet)

Category	2026	2027	2028	2029	2030
Local Groundwater	35,241	32,127	33,642	35,847	33,634
Recycled Water[1]	5,660	5,160	5,403	5,757	5,402
Surface Water	1,893	1,725	1,807	1,925	1,806
Imported Water (TVMWD/MWD)	46,986	42,834	44,853	47,793	44,843
Imported Water (Other)[2]	2,787	2,541	2,661	2,835	2,660
Projected Total Supply	**92,567**	**84,387**	**88,365**	**94,157**	**88,346**
Projected Total Demand	**92,567**	**84,387**	**88,365**	**94,157**	**88,346**

1. To accurately reflect the separation of the Region's potable and non-potable distribution systems, it is assumed that projected Recycled Water supply strictly equals Recycled Water demand for non-potable uses. All other water supplies listed in this table are utilized exclusively to meet potable demands. There is no crossover of non-potable supplies to meet potable demands.
2. This category represents water supplies purchased, transferred, or imported from entities other than TVMWD/MWD (described in **Section 3.1.4**).

Table 5-6. Regional Drought Risk Assessment (2026-2030) Supply and Demand by Source (Regional Total – All Agencies) (Acre-Feet)

Category	2026	2027	2028	2029	2030
Local Groundwater	73,708	67,194	70,361	71,050	68,201
Recycled Water[1]	8,602	7,842	8,212	8,292	7,960
Surface Water	2,844	2,592	2,715	2,741	2,631
Imported Water (TVMWD/MWD)	68,069	62,054	64,978	65,614	62,983
Imported Water (Other)[2]	18,170	16,565	17,345	17,515	16,813
Projected Total Supply	**171,393**	**156,247**	**163,612**	**165,212**	**158,588**
Projected Total Demand	**171,393**	**156,247**	**163,612**	**165,212**	**158,588**

1. To accurately reflect the separation of the Region's potable and non-potable distribution systems, it is assumed that projected Recycled Water supply strictly equals Recycled Water demand for non-potable uses. All other water supplies listed in this table are utilized exclusively to meet potable demands. There is no crossover of non-potable supplies to meet potable demands.
2. This category represents water supplies purchased, transferred, or imported from entities other than TVMWD/MWD (described in **Section 3.1.4**).

While **Table 5-5** and **Table 5-6** illustrate the detailed shift in supply sources for the 2030 horizon, **Table 5-7** and

Table 5-8 demonstrate the Region's total supply reliability across all five-year drought horizons through 2050.

Table 5-7. Multiple Dry Years Supply and Demand (RUWMP Participating Agencies) (Acre-Feet)

Sequence Year	Category	2030	2035	2040	2045	2050
First Year	Projected Supply	92,567	90,845	88,936	87,884	86,885
	Projected Demand	92,567	90,845	88,936	87,884	86,885
	Surplus / Deficit	**0**	**0**	**0**	**0**	**0**
Second Year	Projected Supply	84,387	82,817	81,077	80,118	79,207
	Projected Demand	84,387	82,817	81,077	80,118	79,207
	Surplus / Deficit	**0**	**0**	**0**	**0**	**0**
Third Year	Projected Supply	88,365	86,721	84,898	83,894	82,940
	Projected Demand	88,365	86,721	84,898	83,894	82,940
	Surplus / Deficit	**0**	**0**	**0**	**0**	**0**
Fourth Year	Projected Supply	94,157	92,406	90,464	89,393	88,377
	Projected Demand	94,157	92,406	90,464	89,393	88,377
	Surplus / Deficit	**0**	**0**	**0**	**0**	**0**
Fifth Year	Projected Supply	88,346	86,702	84,880	83,876	82,922
	Projected Demand	88,346	86,702	84,880	83,876	82,922
	Surplus / Deficit	**0**	**0**	**0**	**0**	**0**

Table 5-8. Multiple Dry Years Supply and Demand (Regional Total - All Agencies) (Acre-Feet)

Sequence Year	Category	2030	2035	2040	2045	2050
First Year	Projected Supply	171,393	169,861	167,985	166,994	165,995
	Projected Demand	171,393	169,861	167,985	166,994	165,995
	Surplus / Deficit	**0**	**0**	**0**	**0**	**0**
Second Year	Projected Supply	156,247	154,851	153,141	152,237	151,326
	Projected Demand	156,247	154,851	153,141	152,237	151,326
	Surplus / Deficit	**0**	**0**	**0**	**0**	**0**
Third Year	Projected Supply	163,612	162,149	160,359	159,412	158,458
	Projected Demand	163,612	162,149	160,359	159,412	158,458
	Surplus / Deficit	**0**	**0**	**0**	**0**	**0**
Fourth Year	Projected Supply	165,212	163,736	161,928	160,972	160,009
	Projected Demand	165,212	163,736	161,928	160,972	160,009
	Surplus / Deficit	0	0	0	0	0
Fifth Year	Projected Supply	158,588	157,171	155,435	154,518	153,593
	Projected Demand	158,588	157,171	155,435	154,518	153,593
	Surplus / Deficit	0	0	0	0	0

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 2: Local Agency Urban Water Management Plans

FINAL

2025 RUWMP

JUNE 2026

Part 2 Chapter 1: Three Valleys Municipal Water District 2025 Urban Water Management Plan



THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Appendices

Part 4 of the 2025 RUMWP **Appendix A** contains Agency Supporting Information.

Acronyms and Abbreviations

Acronym	Description
AF	Acre-feet
AFY	acre-feet per year
CDWC	California Domestic Water Company
CIC	Covina Irrigating Company
CRA	Colorado River Aqueduct
CVWC	Covina Valley Water Company
CWC	California Water Code
CWOL	Making Conservation a California Way of Life Regulation
DCP	Drought Contingency Plan
DMMs	Demand Management Measures
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
DYYP	Dry-Year Yield Program
EIRs	Environmental Impact Reports
FY	Fiscal year
GIS	geographic information systems
GPCD	gallons per capita per day
GRIP+	Groundwater Reliability Improvement Program (Plus)
IEUA	Inland Empire Utilities Agency
JWL	Joint Water Line
kWh	kilowatt-hours
LACSD	Los Angeles County Sanitation Districts
MAF	million acre-feet
mg/L	milligrams per liter
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
PBWA	Puente Basin Water Agency
PWRP	Pomona Water Reclamation Plant
PWS	Public Water System
RO	Reserve Osmosis
RUWMP	Regional Urban Water Management Plan
RWD	Rowland Water District
SBX7-7	Senate Bill 7 of Special Extended Session 7
SCAG	Southern California Association of Governments
SJCWRP	San Jose Creek Water Reclamation Plant
SWP	State Water Project
TDS	Total Dissolved Solids
TVMWD	Three Valleys Municipal Water District
UWMP	Urban Water Management Plan

WRMP	Water Resources Master Plan
WRP	water reclamation plant
WSCP	Water Shortage Contingency Plan
WUEData	Water Use Efficiency Data
WVWD	Walnut Valley Water District

Individual UWMP

This chapter describes information specific to the Three Valleys Municipal Water District (TVMWD), including its supplies, demands, and water use efficiency programs. The information and analysis provided in this chapter supplements the regional information presented in **Part 1** of the **2025 Regional Urban Water Management Plan** (RUWMP) and is provided to fulfill the TVMWD's reporting requirements for 2025 under the UWMP Act.

The regional analyses described in Part 1 (Regional Context) of the 2025 RUWMP were conducted using a consistent analytical framework, assumptions, and methodologies that are directly applicable to the TVMWD. TVMWD relies on Part 1 of the RUWMP for the lay description, regional water supply availability, and the underlying technical methodology used to evaluate water supply reliability under normal, single dry-year, multiple dry-year, and five-year drought stress-test conditions.

The water supply reliability assessment and Drought Risk Assessment (DRA) applicable to TVMWD's Urban Water Management Plan (UWMP) are presented in plain language in Part 1 of the 2025 RUWMP, specifically within Chapter 5.

Building upon that regional foundation, the supply and demand comparisons specific to TVMWD are presented in the tables within this UWMP. Unless otherwise noted, the conclusions of the regional water supply reliability assessment and DRA are directly applicable to TVMWD and satisfy the requirements of the Urban Water Management Planning Act and the 2025 UWMP Guidebook. A completed California Department of Water Resources (DWR) UWMP Compliance Checklist for TVMWD is provided in **Part 4, Appendix A-1**.

1. System Description

This section describes the TVMWD water system, service area, population demographics, local climate, and land uses.

TVMWD is a wholesale water agency and was originally formed in January 1950 as the Pomona Valley Municipal Water District under the Municipal Water District Act. TVMWD is governed by a seven-member Board of Directors who each represent one of seven divisions.

TVMWD supplies water on a wholesale basis to its member agencies. TVMWD's member agencies retail the water directly to their customers, or wholesale it to other water systems for resale. TVMWD member agencies produce water from local sources; however, when water demands exceed these local supplies, the member agencies may rely on TVMWD to supply their supplemental water needs. TVMWD is one of the 26 water agencies that make up the Metropolitan Water District of Southern California (MWD).

TVMWD 13 member agencies include the following:

- Boy Scouts of America / City of Industry
- California State Polytechnic University, Pomona
- City of Covina
- City of Glendora
- City of La Verne
- City of Pomona
- Covina Valley Water Company (CVWC)
- Golden State Water Company – Claremont System
- Golden State Water Company – San Dimas System
- Mount San Antonio College
- Rowland Water District (RWD)
- Suburban Water Systems
- Walnut Valley Water District (WVWD)

The 2025 RUWMP was led by TVMWD in collaboration with the following seven member agencies (collectively referred to as the Participating Agencies): City of Glendora, City of La Verne, City of Pomona, Golden State Water Company – Claremont System, Golden State Water Company – San Dimas System, RWD, and WVWD.

The TVMWD service area covers approximately 133 square miles encompassing the eastern portion of Los Angeles County and includes the Cities of Claremont, Covina, Diamond Bar, Glendora, Industry, La

Verne, Pomona, San Dimas, Walnut, West Covina, and unincorporated areas of Los Angeles County (including Charter Oak and Rowland Height). The TVMWD's service area is shown in **Figure 1-1**.

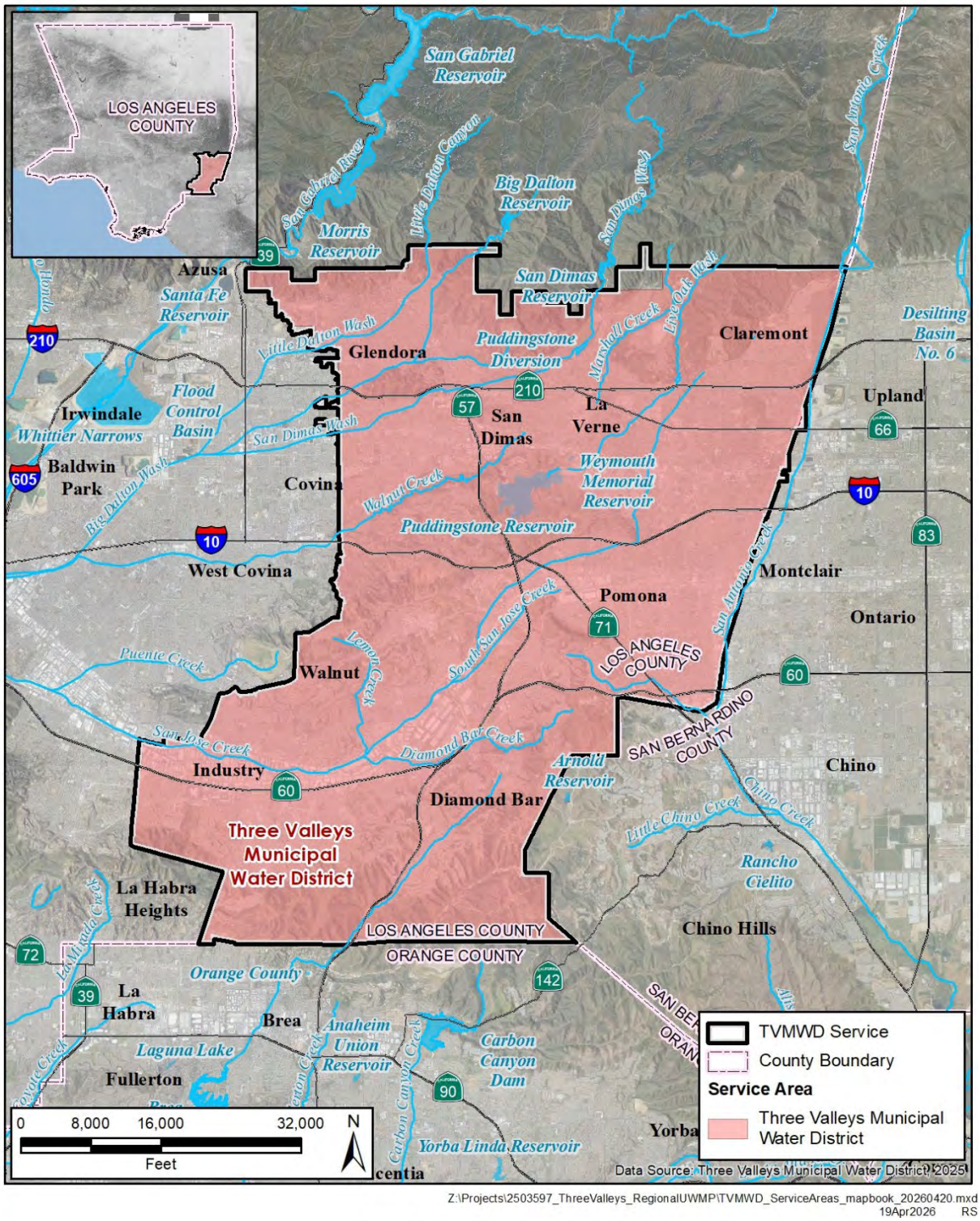
TVMWD receives untreated imported water from MWD for treatment at the Miramar Water Treatment Plant and also produces groundwater from three Six Basins wells, which is treated at the same facility. Treated water from the Miramar Plant is delivered to TVMWD's member agencies and may also be conveyed through the Pomona-Walnut-Rowland Joint Water Line (JWL). The JWL supplies the City of Pomona, Walnut Valley Water District, and Rowland Water District, and is managed as a joint-powers agency representing these entities.

TVMWD also receives untreated imported water from MWD for groundwater spreading and replenishment in the Main San Gabriel Basin and Six Basins through the CENB-48, PM-26, PM-GWR, PM-SGP, PM-SGP-01, and USG-03 connections.

Additionally, TVMWD delivers untreated imported water from MWD to CVWC (formerly Covina Irrigating Company (CIC)) via the MWD-SGP-03 connection, which CVWC treats at the William B. Temple Treatment Plant. TVMWD also provides treated imported MWD water directly to its sub-agencies through the following service connections:

- Boy Scouts of America (PM-14)
- Cal Poly Pomona (PM-08)
- City of Covina (PM-19)
- Covina Valley Water Company (formerly CIC) (PM-SGP-03)
- City of Glendora (PM-06, PM-18, PM-23)
- Golden State Water Company (PM-07, PM-16)
- Joint Water Line (PM-15A, PM-15B)
- Mt. San Antonio College (PM-01)
- City of Pomona (PM-11)
- Rowland Water District (PM-09, PM-22)
- Walnut Valley Water District (PM-10, PM-12, PM-24)

Figure 1-1. Service Area



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1.1. Service Area

TVMWD is a wholesale water agency and is not required by DWR to provide Public Water System (PWS) information. TVMWD meets the definition of an urban water supplier, as it supplies more than 3,000 acre-feet per year (AFY) of water wholesale for municipal purposes.

The regional climate, which includes the TVMWD's service area, is described in **Part 1 Chapter 2** of the 2025 RUWMP.

1.1.1. Population, Demographics, and Socioeconomics

Estimates of population served by TVMWD are based on the 2020 U.S. Census Bureau and the Southern California Association of Governments (SCAG) (Southern California Association of Governments, 2024). A geographic information systems (GIS) analysis of 2020 Census data was used to determine the TVMWD's 2020 service area population, which was 515,688. To project the population served by TVMWD from 2025 to 2050, average annual population growth rates from SCAG projections were applied to the 2020 population. A GIS analysis of SCAG projection data was used to determine the SCAG growth rate specific to TVMWD's service area. SCAG projected an increase in population from 2019 to 2035 averaging 0.24% per year and from 2035 to 2050 averaging 0.08% per year. Estimated current and projected populations of the TVMWD's service area are included in **Table 1-1**.

Table 1-1. Current and Projected Population

Population Served	2025	2030	2035	2040	2045	2050
Total	523,431	531,175	538,918	541,175	543,431	545,688

The regional demographics and socioeconomics in the TVMWD's service area[1] (Region) is described in **Part 1 Chapter 2** of the 2025 RUWMP.

1.1.2. Land Use

Per the Fiscal Year (FY) 2024-2025 TVMWD Assessed Service Area by Land Use, the TVMWD's land use distribution by parcel count is as follows:

- Single-Family Residential: 80%
- Multi-Family Residential and Condominiums: 14%
- Mobile Homes: <1%
- Commercial: 3%
- Churches: <1%
- Industrial: 2%

[1] The Three Valleys Municipal Water District service area is referred to as the Region in the context of **Part 1 of** the 2025 RUWMP.

- Recreational Camping Facilities: <1%
- Vacant Residential: 2%
- Vacant Non-Residential: 1%

2. Water Use

This section describes the current and projected water uses within the TVMWD's service area**.**

2.1. Water Use by Sector

2.1.1. Water Use Sectors Listed in Water Code

Water suppliers are required to identify water uses, to the extent that records are available, for at least each of the water use sectors identified in California Water Code (CWC) 10631(d) to assist in the water demand projections. Recycled water uses are described in **Section 4.5.**

TVMWD provides water service to two water use sectors:

Sales to Other Agencies

This includes water sales made to another agency. Projected sales may be based on projected demand provided by the receiving agency. There is inherent uncertainty in future projections, therefore, any projected sales reported in the UWMP are for planning purposes only and are not considered a commitment on the part of the seller. This is a wholesale demand.

Groundwater Recharge

The managed and intentional replenishment of natural groundwater supplies using man-made conveyances such as infiltration basins or injection wells. Water used for groundwater banking or storage may also be reported using this sector.

2.1.2. Past and Current Water Use

TVMWD's water consumption by water use categories in 2025 is shown in **Table 2-1**. To accurately reflect TVMWD's operational framework and historical accounting practices, these deliveries are broken down by their specific receiving facility or end-use. It is important to note that raw, untreated imported water delivered to the Miramar Water Treatment Plant and CVWC is technically classified as "non-potable" at the point of wholesale delivery, as it requires treatment to meet drinking water standards prior to retail distribution.

In 2025, TVMWD's total wholesale delivery was 54,766 acre-feet (AF). Approximately 93% of TVMWD's deliveries were to sales to other agencies (including raw water for treatment and treated water for direct potable use). The remaining 7% was delivered as untreated water for groundwater recharge. Over the past five years, TVMWD has delivered an average of 53,871 AFY.

Table 2-1. DWR 4-1W Actual Demands for Water, 2025, AF

Use Type	Additional Description	Potable or Non-Potable (*optional)*	2025 Volume
Sales to Other agencies	Miramar Treatment Plant	Non-Potable	21,843
Sales to Other agencies	Covina Valley Water Company	Non-Potable	6,648
Sales to Other agencies	Direct Deliveries (MWD)	Potable	22,611
Sales to Other agencies	Direct Deliveries (Six Basins)	Potable	81
Groundwater Recharge	Spreading / Replenishment	Non-Potable	3,583
		Total	**54,766**

2.1.3. Distribution System Water Losses

As a wholesale supplier, TVMWD is not required by DWR to perform water loss audits and report distribution system water loss.

2.2. Projected Water Use

While Water Code Section 10631(d) does not strictly require Wholesale Suppliers to report quantities of projected water uses by sector, doing so provides critical context for the Region's long-term supply and demand assessments.

TVMWD's projected wholesale water demands over the next 25 years were developed using the regional "bottom-up" aggregation methodology detailed in **Section 4.8** and **Section 5.3**. The total projected demands reflect the aggregated imported water requirements of the retail agencies within the TVMWD service area, plus TVMWD's planned local groundwater extraction from the Six Basins.

Table 2-2 summarizes these projected wholesale demands. While historical actuals (shown in **Table 2-1**) are tracked by specific delivery facility, future projections are grouped into broader categories because the regional model forecasts total wholesale need rather than specific facility-level routing. The aggregated regional demand is allocated to "Sales to other agencies," which represents a mix of both treated potable deliveries and raw, non-potable deliveries intended for retail-level treatment.

Table 2-2. DWR 4-2W Projected Demands for Water Use, AFY

Use Type	Additional Description	Water Quality (Optional)	2030	2035	2040	2045	2050
Sales to Other Agencies	n/a	n/a	59,930	55,315	54,118	53,897	53,899
Groundwater Recharge	n/a	Non-Potable	3,000	3,000	3,000	3,000	3,000
		Total	**62,930**	**58,315**	**57,118**	**56,897**	**56,899**

2.3. Water Use for Lower Income Households

As a wholesale supplier, TVMWD's is not required by DWR to include projections of lower-income household water use.

2.4. Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. A recent Climate Change Vulnerability Assessment utilizing data from DWR and 20 global climate models suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** of the 2025 RUWMP includes an assessment of the potential impacts of climate change.

3. SB X7-7 Compliance & Future Water Use Efficiency Requirements

This section describes compliance with the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7).

Wholesale suppliers are not required to calculate baseline, target, or compliance gallons per capita per day (GPCD). Instead, they must provide an assessment of the present and proposed future measures, programs, and policies that assist the retail suppliers in their wholesale service area in achieving their SB X7-7 Targets.

TVMWD participates in wholesale agency programs that provide financial incentives for water conservation, technical support through workshops, and staff assistance for implementing conservation projects. For example, retrofit and rebate programs offer financial incentives to replace high-water-use fixtures with high-efficiency devices. Some of the most effective measures include regional conservation programs funded by MWD (and passed through TVMWD) and made available to the TVMWD's member agencies.

In addition, TVMWD has supported and adopted various policies to encourage demand reduction within its service area. Regional conservation programs are also available to local agencies and provide additional opportunities to promote water-use efficiency.

Supported, in part, by regional conservation programs, all of the Participating Agencies in this RUWMP met their SB X7-7 targets by 2020.

Information regarding the TVMWD's wholesale agency conservation programs is discussed in **Section 8**.

4. Water Supply

TVMWD utilizes two primary sources for water supply: treated imported surface water purchased from the MWD and groundwater pumped from the Six Basins.

4.1. Purchased or Imported Water

TVMWD depends upon MWD for its current and future imported water supplies. MWD supplies imported water to TVMWD, which in turn provides imported water to its member agencies.

Imported water supplies include several categories of deliveries from MWD. These categories include:

- Untreated imported water for potable treatment: Untreated MWD supply delivered to TVMWD and treated at the Miramar Water Treatment Plant (service connection PM-21).
- Untreated imported water for spreading basins and groundwater replenishment of the Main Basin and Six Basins: Water delivered for groundwater recharge and replenishment through the several connections (PM-21-SASG, PM-26, PM-GWR, PM-SGP, PM-SGP01, USG-03, CENB-48, and OC-59).
- Untreated imported water treated by CVWC (formerly CIC): Untreated MWD supply delivered through the MWD-SGP03 connection and treated at CVWC (formerly CIC) William B. Temple Treatment Plant.
- Treated imported water for direct use: Treated MWD supply delivered for direct potable use through several service connections (PM-01, PM-06, PM-07, PM-08, PM-09, PM-10, PM-11, PM-12, PM-14, PM-15A, PM-15B, PM-16, PM-18, PM-19, PM-22, PM-23, and PM-24).

The reliability of future supplies of imported water historically has been impacted by the sources of supply available to MWD. The reliability of these imported water supplies is discussed further in **Part 1, Chapter 3** and **Chapter 5** of the 2025 RUWMP.

4.1.1. Purchased Local Surface Water

In addition to imported water from MWD, TVMWD occasionally purchases San Antonio Creek surface water supplies diverted by the City of Pomona to support its regional groundwater replenishment goals. In the spring of 2015, TVMWD connected to the City of Pomona's Canon pipeline that conveys water from San Antonio Creek (behind San Antonio Dam) to the City of Pomona's Pedley Filtration Plant located in the City of Claremont. TVMWD has the ability to purchase this surface water and direct it into spreading basins via pipeline extensions within the San Antonio Spreading Grounds, which directly benefits TVMWD's groundwater extraction wells located in the Six Basins.

4.2. Groundwater

TVMWD can extract groundwater from Six Basins, which is adjudicated and managed for long-term sustainability, as discussed further in **Part 1, Chapter 3** of the 2025 RUWMP.

4.2.1. Six Basins

TVMWD produces groundwater from three wells located in the Six Basins. Raw groundwater produced from these wells is delivered to the TVMWD's Miramar Water Treatment Plant, where it is treated and blended with imported water supplies before being distributed to member agencies. **Table 4-1** summarizes the TVMWD's actual groundwater production from the Six Basins over the past five years.

The Six Basins is adjudicated and managed by the Six Basins Watermaster. TVMWD pumps from the "Four Basins" operational area, which is subject to an Operating Safe Yield (OSY) determined annually by the Watermaster. TVMWD's percent share of the Four Basins OSY is 0.130%. Based on the Watermaster's 2025 OSY determination of 14,000 AF, TVMWD's base pumping right equates to approximately 18.2 AFY. However, as shown in **Table 4-1**, TVMWD is able to legally and physically sustain groundwater production in excess of this base right because of its unique dual role as both a basin replenisher and producer.

As detailed in **Part 1, Chapter 3 of the 2025 RUWMP**, TVMWD holds a 3,500 AF direct operational storage account within the Six Basins. TVMWD actively replenishes the basin by delivering untreated imported water to the San Antonio Spreading Grounds (or via interconnections like the Canon pipeline). By banking this imported water, TVMWD can subsequently extract it to meet elevated demands at the Miramar Water Treatment Plant. Furthermore, any extractions that exceed TVMWD's base rights and banked storage are mitigated by paying Replacement Water assessments, ensuring long-term basin sustainability while providing operational flexibility for TVMWD's wholesale operations.

Table 4-1. DWR 6-1W Groundwater Pumped Last Five Years (AF)

Groundwater Type	Location or Basin Name	2021	2022	2023	2024	2025
Alluvial Basin	Six Basins	859	1,034	686	2,347	81
	Total	**859**	**1,034**	**686**	**2,347**	**81**

4.3. Surface Water

TVMWD does not own surface water rights and does not use self-supplied surface water sources to meet its water demands. TVMWD's purchased local surface water from San Antonio Creek is described in **Section 4.1**.

4.4. Stormwater

TVMWD does not directly use stormwater to meet its water demands.

4.5. Wastewater and Recycled Water

TVMWD does not directly collect, treat, distribute, or have access to wastewater or recycled water at the wholesale level. However, a number of its member agencies use recycled water as part of their local water resource supply portfolios to offset potable demand. Wastewater treatment and recycled water use in the Region is presented in **Part 1, Chapter 3** of the 2025 RUWMP.

4.5.1. Potential, Current, and Projected Recycled Water Uses

Recycled water usage is not applicable to TVMWD as a wholesale supplier. See **Part 1, Chapter 3** of the 2025 RUWMP for recycled water use in the Region.

4.6. Water Exchanges and Transfers

TVMWD participates in MWD's Dry-Year Yield Program (DYYP). The DYYP is a groundwater storage and recovery program where supplemental water is stored in the Chino Basin during surplus years and could be recovered in-lieu of imported water from MWD through Inland Empire Utilities Agency (IEUA). The DYYP allows maximum use of imported water supplies available during wet years and stored groundwater in the Chino Basin during dry years. The DYYP can store up to 100,000 AF with maximum replenishment of 25,000 AFY and maximum extraction of 33,00 AFY. Based on the Chino Basin Watermaster 2024/2025 Assessment Package, during FY 2023-2024, there was 45,908.2 AF within the DYYP account. The agreement that authorized the DYYP will expire in 2028.

Due to the uncertainties associated with the reliability of imported water, TVMWD and some of its member agencies have explored water transfers, especially those agencies more reliant on imported water.

Water rights under the Six Basins Judgment can be transferred by assignment, sale, contract, or lease so long as such transfers meet the requirements of the Judgment. However, a Party's right to produce, store or recover groundwater in the Four Basins Area may not be transferred, exchanged or exercised in the Two Basins Area. In addition, a Party's right to produce, store or recover groundwater in the Two Basins Area may not be transferred, exchanged or exercised in the Four Basins Area. TVMWD and several of its member agencies are able to utilize the transfer opportunities available for Six Basins water when necessary.

Some of TVMWD's member agencies have also investigated the potential to transfer water from water rights held north of the Delta. These investigations are also in their early stages and appear promising from a cost perspective. If the completed analysis shows that the cost of delivering this water is comparable to alternative supplies, it could result in additional resources within the area served by TVMWD.

4.7. Future Water Projects

As part of the TVMWD Water Resources Master Plan (WRMP) and Drought Contingency Plan (DCP) with the member agencies, the TVMWD is currently pursuing several projects to increase water supply reliability. Future projects include:

- **Miramar Pumpback:** This project will improve system interties by installing infrastructure capable of reversing the flow of water within the transmission system. By enabling bi-directional flow, this project enhances regional redundancy and allows treated water from the Miramar Water Treatment Plant to be reliably delivered to member agencies during outages or constraints on the MWD delivery system. While this project increases the system's operational

capacity and flexibility by approximately 20,000 AFY, it functions as a conveyance reliability enhancement rather than a newly generated water source. Therefore, to avoid double-counting, this volume is not included as an independent supply line item in the TVMWD's future supply projections in **Section 4.8**.

- Filter Drain Valves for groundwater treatment.
- Padua Pump Station to improve system interties.
- Solids Handling Improvements to upgrade aging infrastructure and support water conservation and efficiency.
- Well 2 Improvements to enhance well efficiency.
- PM-21 [Miramar] Bypass Magmeter to support conservation and efficiency.
- Hydroelectric Facilities Efficiency Upgrades to upgrade aging infrastructure.
- Groundwater Reliability Improvement Program (see Project 2 below) to improve system interties and enhance well efficiency. This project is expected to increase overall supply by approximately 9,000 AF.
- Miramar System Inspection to upgrade aging infrastructure.

In addition, as part of the WRMP and DCP efforts, four regional water supply projects were identified through collaboration with TVMWD, member agencies, and regional stakeholders. These regional projects are intended to enhance overall supply reliability for the Region.

- **Project 1:** External Partnership with CVWC (Main Basin)
    - This regional project would include construction of an intertie to access existing water supply from CVWC. Through Puente Basin Water Agency (PBWA), a joint powers authority between WVWD and RWD, WVWD and RWD would lead the construction of this intertie, which would allow pumping of surplus CVWC well and surface water into the Badillo-Grand pipeline via the new interconnection. This regional project would provide an estimated 2,000 AF.
- **Project 2:** TVMWD Groundwater Reliability Improvement Program (GRIP)
    - This regional project would include a TVMWD partnership with the City of Glendora and the Puente Basin Water Agency to implement a regional distribution network and local supplies by utilizing 9,000 AF/year of stranded city assets. The regional distribution network would be augmented by the construction of new treatment facilities and conveyance pipelines. Three Valleys, as the lead agency, will develop the project that includes new replacement wells with wellhead treatment for City of Glendora's Wells #3, 4, and 7, and the pipeline and pumpstations. This regional project could also be expanded to address water quality concerns for more member agencies. This project would increase regional water supply reliability, thereby improving operational flexibility by integrating additional water sources into the existing network. This regional project would provide an estimated 9 TAF.

- **Project 3:** TVMWD Storing Water in Main San Gabriel Basin (GRIP+)
    - This regional project would include a TVMWD partnership with the City of Glendora and City of Pomona in which TVMWD would store surplus imported water in wet years for the cities via groundwater recharge at the Santa Fe Spreading Grounds in the Main San Gabriel Basin. The project would also include the drilling of five new wells (two for the City of Glendora, three for the City of Pomona) along with wellhead treatments for all five wells, as well as the installation of approximately five miles of potable water pipeline by connecting Main San Gabriel Basin supplies to the City of Pomona's distribution system via the Pomona-Walnut-Rowland Joint Water Line (JWL). This regional project, therefore, would increase water supply reliability and improve operational flexibility by expanding water storage via the Main San Gabriel Basin, creating infrastructure to integrate supplies into the existing network, and increasing groundwater treatment capacity. This project would produce approximately 9,200 AF of local groundwater supply.
- **Project 4:** TVMWD-Pomona Chino Basin Conjunctive Use Exchange
    - This regional project would include a partnership between TVMWD and the City of Pomona. TVMWD will store water in the Chino Basin and fund the City of Pomona's infrastructure projects in exchange for the pumping and delivery of water for use by the TVMWD member agencies, such as the City of La Verne, Golden State Water Company and the Puente Basin Water Agency. The exchange water could also be conveyed from the Chino Basin to respective member agencies via the JWL and the Badillo/Grand Transmission Main. Alternate water conveyance arrangements could also be considered to enable broader participation and access to water supply benefits by interested member agencies. This project would increase regional water supply reliability and reduce dependence on imported water during droughts, thereby improving operational flexibility by integrating additional water sources into the existing network.

As development progresses and increased demands are placed on the system, TVMWD and its member agencies will determine which projects to implement.

4.8. Summary of Existing and Planned Sources of Water

TVMWD's wholesale water supply is comprised of treated and untreated imported water from MWD, supplemented by a small amount of local groundwater extracted directly by TVMWD from Six Basins, as discussed in **Section 4.1**. Imported water supplies include several categories of deliveries from MWD, which are used for potable treatment, direct use, and groundwater replenishment.

The volume of water utilized from each source in 2025 is summarized in **Table 4-2**. To accurately reflect deliveries within the DWR Water Use Efficiency Data (WUEData) portal, MWD imported water is separated into two categories in **Table 4-2**: "potable" for treated water delivered directly to member agencies, and "non-potable" for raw, untreated water delivered to the Miramar Water Treatment Plant, the CVWC, and local spreading grounds for groundwater recharge.

TVMWD's projected supply is summarized in **Table 4-3**.

Table 4-2. DWR 6-8W Actual Water Supplies in 2025 (AF)

Water Supply	Additional Detail on Water Supply	2025 Actual Volume	2025 Potable or Non-Potable (*optional*)	2025 Total Entitlement (*optional*)
Purchased or Imported Water	Metropolitan Water District – TVMWD (Direct Deliveries)	22,611	Potable	n/a
Purchased or Imported Water	Metropolitan Water District – TVMWD (Raw Water to Water Treatment Plants, Spreading)	32,074	Non-Potable	n/a
Groundwater (not desalinated)	Six Basins	81	Potable	n/a
	Total	**54,766**	**-**	**-**

4.8.1. Supply Projection Methodology (Wholesale Aggregation)

As a regional wholesaler, TVMWD's future water supply projections are intrinsically tied to the projected demands of its member agencies. Rather than running an independent demand forecasting model, TVMWD, in coordination with its Participating Agencies, utilized a "bottom-up" aggregation methodology to determine future wholesale supply requirements. Under the "Real Water" (Utilization-Based) approach utilized by the retail agencies in this 2025 RUWMP, each agency projected its local groundwater and recycled water supplies based on historical averages adjusted for climate change. Any remaining unmet demand at the retail level was assumed to be fulfilled by purchasing imported water from TVMWD.

To calculate TVMWD's projected wholesale supplies shown in **Table 4-3**, the following steps were applied:

1. **Aggregation of Regional Reliance:** The projected imported water demands from all 13 retail agencies within the TVMWD service area (both Participating Agencies and other member agencies operating within the TVMWD service area) that are specifically supplied by TVMWD were aggregated. This isolates TVMWD's wholesale obligations from other third-party imported water sources in the Region (such as California Domestic Water Company (CDWC) deliveries). Because the other member agencies are not formal signatories to the 2025 RUWMP, their projected demands and supplies were estimated using the best available planning resources, including 2020 UWMPs, environmental documentation (e.g., EIRs), Watermaster Reports, and data previously provided for TVMWD's WRMP and DCP.
2. **Evaluation Against MWD Supply Reliability:** The aggregated TVMWD-specific wholesale demand for imported water was compared against MWD's projected supply availability. Because MWD recently transitioned away from its historical Purchase Order system and tiered allocation limits, TVMWD's supply sufficiency is evaluated directly against MWD's 2025 UWMP reliability modeling, which demonstrates 100% supply capability to meet all member agency supplemental demands through 2050 (MWD, 2026).

As demonstrated in the regional analysis **(Part 1, Chapter 5** of the 2025 RUWMP**)**, the aggregated wholesale demand for TVMWD imported water across the TVMWD service area is projected to peak at

59,930 AF in 2030 and taper to 53,899 AF by 2050 (largely due to increased local supply development and conservation by retail agencies). To meet this total wholesale demand, TVMWD utilizes its own direct groundwater extraction from the Six Basins, which is projected at 3,000 AFY. This local groundwater production directly offsets the volume of imported water TVMWD is required to purchase. As a result, TVMWD's projected imported water purchases from MWD is projected to drop from 59,930 AF in 2030 to 53,899 AF by 2050. To align with the projected demand methodology established in **Section 2.2**, the projected imported water supplies from MWD shown in **Table 4-3** are delineated into two categories: water intended for direct deliveries and treatment, and water anticipated for groundwater recharge and spreading.

Backed by MWD's massive regional storage reserves and 100% projected supply capability (MWD, 2026), TVMWD projects sufficient reliability to meet all wholesale requests through the 2050 planning horizon.

Table 4-3. DWR 6-9W Projected Water Supplies (AF)

Water Supply	Additional Detail on Water Supply	2030	2035	2040	2045	2050
Groundwater (not desalinated)	Six Basins	3,000	3,000	3,000	3,000	3,000
Purchased or Imported Water	Metropolitan Water District – TVMWD (Groundwater Recharge, Spreading)	3,000	3,000	3,000	3,000	3,000
Purchased or Imported Water	Metropolitan Water District – TVMWD	56,930	52,315	51,118	50,897	50,899
	Total	**62,930**	**58,315**	**57,118**	**56,897**	**56,899**

4.9. Energy Intensity of Water Supplies

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2025, TVMWD generated 42.15 kWh of energy per AF of water delivered from its hydroelectric generators, eliminating the energy consumption of its water facilities.

5. Water Service Reliability Assessment

This section considers TVMWD's water supply reliability during normal years, single dry years, and up to five consecutive dry water years. As the regional wholesaler, TVMWD's supply reliability assessment discusses macroeconomic, infrastructural, and regulatory factors that could potentially limit the expected quantity of imported water available to its member agencies through 2050.

5.1. Constraints on Water Sources

While TVMWD maintains a highly reliable wholesale water portfolio backed by MWD, its imported supply sources are subject to various environmental, regulatory, and infrastructural constraints. A comprehensive analysis of regional water supply constraints is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the 2025 RUWMP.

For TVMWD specifically, the primary constraints on water sources include:

- **Statewide Hydrology and Regulatory Constraints:** The amount of water delivered to TVMWD through the State Water Project (SWP) and Colorado River Aqueduct (CRA) is highly dependent on statewide hydrology and regulatory constraints (such as pumping restrictions in the Sacramento-San Joaquin Bay-Delta). However, as detailed in **Part 1, Chapter 3** of the 2025 RUWMP, MWD does not directly pass State-mandated SWP allocation reductions to TVMWD. Instead, MWD buffers these hydrologic shortages using its massive regional storage portfolio, guided by its Water Surplus and Drought Management (WSDM) Plan and Water Shortage Contingency Plan (WSCP) (MWD, 2026).
- **Infrastructure Bottlenecks (SWP-Dependent Areas):** While MWD's aggregate supply is highly reliable, TVMWD must navigate localized infrastructure constraints. Due to pipeline elevations and network physics, certain northern portions of the TVMWD service area – specifically serving the City of Glendora and the City of La Verne – are classified as "SWP-Dependent Areas" because they cannot physically receive Colorado River water. During severe multi-year droughts, physical limitations in delivering stored water to the Rialto Pipeline can trigger localized shortages and emergency mandates (such as the 2022 SWP-Dependent Area Emergency Conservation Program). To mitigate this, TVMWD must creatively manage reliability by shifting supplies via the Pomona-Walnut-Rowland JWL and utilizing its cyclic storage accounts in the Main San Gabriel and Six Basins to offset localized imported deficits.
- **Water Quality and Salinity:** MWD attempts to blend higher-salinity CRA water with lower-salinity SWP water to achieve a target Total Dissolved Solids (TDS) of approximately 500 milligrams per liter (mg/L) for its treated water deliveries. However, during severe drought years when SWP allocations are drastically reduced, MWD must rely more heavily on the CRA. During these periods, TVMWD experiences higher salinity and mineral content in its raw imported supplies, which impacts treatment operations at the Miramar Water Treatment Plant and can affect member agencies' local groundwater recharge capabilities due to strict Regional Water Quality Control Board Basin Plan objectives.

5.2. Year Type Characterization

As a wholesale supplier, TVMWD's vulnerability to seasonal and climatic changes is driven by the aggregated demands of its member agencies. During hotter, drier baseline conditions, retail agencies experience spiked demands for outdoor irrigation while simultaneously facing reduced natural recharge in their local groundwater basins. To meet this gap, some retail agencies pivot their operations, leaning more heavily on TVMWD to supply treated imported water. Therefore, TVMWD's drought stress is defined by the peaks in aggregated regional imported water requests.

Because TVMWD's baseline years encompass a mix of different hydrologic conditions, it is important to note how TVMWD's wholesale supply strategy adapts to dry years. TVMWD's primary source of supply, imported water from MWD, is highly insulated against dry-year constraints due to MWD's massive regional storage portfolio (nearly 4 million acre-feet (MAF)) and the 100% supply capability demonstrated in MWD's 2025 UWMP (MWD, 2026). Furthermore, TVMWD utilizes its cyclic storage accounts in the Main San Gabriel Basin and Six Basins to physically buffer localized infrastructure constraints in SWP-Dependent Areas. As a result, TVMWD's operational supply strategy remains highly reliable and is not significantly disrupted in dry years compared to normal years. Unlike retail agencies whose long-term supply baselines shift due to direct climate change impacts on local hydrology, the changes in TVMWD's projected baseline supply over time (as detailed in **Section 4.8**) are primarily driven by the changing demands of its retail agencies as they implement local supply projects and "Making Conservation a California Way of Life" (CWOL) conservation mandates.

Per UWMP requirements, TVMWD has evaluated reliability for an average year, single dry year, and a five consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** The single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** The driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

To characterize these year types, TVMWD evaluated historical supply and demand data across the entire 136 square mile service area. For the purposes of this 2025 UWMP, TVMWD established a "Normal Year" baseline using the average annual supply and demand from 2021 through 2025.

Because wholesale demand for imported water peaks during dry years to offset local retail supply deficits, the "Single Dry Year" and "Five-Year Drought" scenarios are modeled using historical years where TVMWD's imported water production peaked to meet these elevated regional drought demands. **Table 5-1** summarizes the base years utilized for this analysis and the corresponding volume of water available/utilized as a percentage of the average year.

It is important to note that while **Table 5-1** illustrates TVMWD's historical delivery variance during drought conditions, these static historical percentages are not used as linear multipliers to calculate future drought demands. Instead, as described in the following section, future wholesale drought demands are derived dynamically from the Region's bottom-up mass-balance model (described in **Part 1, Chapter 5** of the 2025 RUWMP).

Table 5-1. DWR 7-1W Basis of Water Year Data

Year Type	Base Year (FY)	Volume Available (AF)	% of Average Supply
Average Year	2021-2025	56,387	100%
Single-Dry Year	2021	70,282	125%
Consecutive Dry Years 1st Year	2018	68,486	121%
Consecutive Dry Years 2nd Year	2019	63,648	113%
Consecutive Dry Years 3rd Year	2020	76,723	136%
Consecutive Dry Years 4th Year	2021	70,282	125%
Consecutive Dry Years 5th Year	2022	65,606	116%

5.3. Water Service Reliability

The results of the reliability assessment are summarized below.

As established in **Section 4.8**, TVMWD utilized a "bottom-up" aggregation methodology to project its future wholesale supplies and demands. Under this operational approach, TVMWD's "Normal Year" wholesale demands over the next 25 years were developed by extracting the specific TVMWD imported water requirements from the regional mass-balance model. This isolates TVMWD's wholesale obligations from other third-party imported water sources in the region (such as CDWC deliveries) (see **Part 1, Chapter 5** of the RUWMP). These retail projections incorporate anticipated reductions due to passive conservation and compliance with the new "Making Conservation a California Way of Life" (CWOL) regulatory framework, resulting in TVMWD's normal wholesale demand peaking at 62,930 AF in 2030 and tapering to 56,899 AF by 2050.

Unlike retail agencies that may apply a static historical scaling factor to project future drought demands, TVMWD utilized the regional stress-test modeling developed for this RUWMP (see **Part 1, Chapter 5** of the RUWMP). Rather than applying the historical percentages from **Table 5-1** to future years, the regional model calculates these future retail deficits year-by-year and assigns the residual demand directly to TVMWD's imported water system.

As discussed in **Section 4.8**, because MWD has transitioned to a single volumetric rate structure, TVMWD's supply sufficiency is evaluated directly against MWD's regional supply capabilities rather than historical tiered allocation limits. Under the most severe modeled drought condition (Year 3 of the 2030 Five-Year Drought scenario), aggregated regional demand on TVMWD peaks at 85,626 AF. A critical finding of this reliability assessment is that MWD possesses sufficient reserves – including nearly 4 MAF of regional storage – to meet these projected demands without requiring extraordinary measures (MWD, 2026). Consequently, TVMWD can reliably meet the peak wholesale demands of its member agencies without even needing to draw down its 54,000+ AF of regional cyclic storage accounts.

Because TVMWD and MWD have demonstrated 100% supply reliability to meet wholesale demands through 2050, TVMWD's total supply is projected to meet its total projected demand across all hydrologic scenarios. The difference between supply and demand in the DWR submittal tables is zero, reflecting a fully reliable wholesale portfolio through the 2050 planning horizon. Furthermore, as documented in MWD's 2025 UWMP (MWD, 2026), MWD projects a regional supply surplus across all modeled drought scenarios through 2050, ensuring TVMWD has the continuous ability to secure any additional imported water required to meet unforeseen shifts in member agency demands.

Table 5-2, **Table 5-3**, and **Table 5-4** summarize TVMWD's projected water supplies and demands over the next 25 years in five-year increments. These tables indicate TVMWD can reliably meet elevated water demands during normal years, single dry years, and five-consecutive-year drought periods over the next 25 years.

It is important to note that the total supply and demand figures presented in the DWR submittal tables below reflect TVMWD's entire wholesale portfolio. The total wholesale demands on TVMWD by its member agencies are met by a combination of imported water from MWD and the 3,000 AFY of local groundwater extraction TVMWD expects to produce from the Six Basins. Therefore, the total volumes in the tables below represent the sum of the dynamic imported water demand calculated by the bottom-up regional model plus this 3,000 AFY of local groundwater production.

Table 5-2. DWR 7-2W Normal Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	62,930	58,315	57,118	56,897	56,899
Demand totals	62,930	58,315	57,118	56,897	56,899
Difference	**0**	**0**	**0**	**0**	**0**

Table 5-3. DWR 7-3W Single Dry Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	78,438	72,686	71,194	70,918	70,921
Demand totals	78,438	72,686	71,194	70,918	70,921
Difference	**0**	**0**	**0**	**0**	**0**

Table 5-4. DWR 7-4W Multiple Dry Years Supply and Demand Comparison

Year	Totals	2030	2035	2040	2045	2050
First Year	Supply Totals	76,433	70,828	69,374	69,106	69,108
	Demand Totals	76,433	70,828	69,374	69,106	69,108
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	71,034	65,825	64,474	64,224	64,226
	Demand Totals	71,034	65,825	64,474	64,224	64,226
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	85,626	79,347	77,718	77,417	77,420
	Demand Totals	85,626	79,347	77,718	77,417	77,420
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	78,438	72,686	71,194	70,918	70,921
	Demand Totals	78,438	72,686	71,194	70,918	70,921
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	73,219	67,850	66,457	66,200	66,202
	Demand Totals	73,219	67,850	66,457	66,200	66,202
	Difference	**0**	**0**	**0**	**0**	**0**

6. Drought Risk Assessment

The Drought Risk Assessment (DRA) is required for the 202**5** UWMP, with a focus on the five-year consecutive drought scenario beginning in 2026. While **Section 5** evaluated long-term reliability through 2050, the DRA serves as an immediate stress test, focusing specifically on the five-year period from 2026 through 2030. The purpose of this assessment is to determine if TVMWD anticipates any supply shortages in the immediate future that would necessitate triggering mandatory demand reduction measures outlined in the WSCP.

6.1. Data, Methods, and Basis for Water Shortage Conditions

To conduct the DRA, TVMWD utilized the same "Real Water" supply methodology and historical drought scaling factors detailed in **Section 4.8** and **Section 5**. The assessment simulates a severe, five-consecutive year drought mirroring the hydrology of FYs 2018 through 2022.

Because hot, dry weather drives increases in outdoor irrigation and reduces local surface water and natural groundwater recharge, retail agencies typically see declines in their local surface water and groundwater capacities during prolonged droughts. As a result, some retail agencies pivot their operations and increasingly rely on TVMWD to offset their localized deficits. Rather than using static historical multipliers, TVMWD's near-term drought demands are generated by the regional mass-balance model, which dynamically calculates the anticipated retail deficits and assigns the residual demand directly to TVMWD's wholesale system. The DRA tests whether TVMWD's imported water portfolio and local Six Basins groundwater extraction can sustain these elevated wholesale demands over the next five years.

6.2. DRA Water Source Reliability

TVMWD's near-term wholesale reliability is highly secure. This security is anchored by the storage reserves held by MWD and TVMWD's own extensive cyclic storage accounts.

Entering the 2026–2030 DRA period, MWD holds nearly 4 MAF of water in regional storage, which is a near-record high. MWD's 2025 UWMP DRA modeling confirms that even if the SWP and CRA experience five-consecutive years of severe constraint, MWD has sufficient stored reserves to meet all wholesale member agency demands without shortage allocations through 2030.

Furthermore, as discussed in **Section 4.8**, because MWD has transitioned to a single volumetric rate structure, TVMWD's supply sufficiency is evaluated directly against MWD's regional supply capabilities rather than historical tiered allocation limits. A critical finding of this reliability assessment is that MWD possesses sufficient reserves – including nearly 4 MAF of regional storage – to meet these projected demands without requiring extraordinary measures (MWD, 2026). Consequently, TVMWD can reliably meet the peak wholesale demands of its member agencies without even needing to draw down its 54,000+ AF of regional cyclic storage accounts.

6.3. Total Water Supply and Use Comparison

Table 6-1 details the DRA for the 2026–2030 period. As demonstrated in the table, TVMWD's projected supplies are sufficient to fully and consistently meet the elevated wholesale demands for every year of the five-year drought sequence.

Because TVMWD anticipates sufficient supply capacity (resulting in a difference of zero between required supply and demand) across all five years of the near-term drought scenario, TVMWD does not currently project a need to implement mandatory wholesale supply allocations or trigger advanced stages of its WSCP due to supply shortages. However, TVMWD remains committed to ongoing regional water conservation programs and will continue to collaborate with its retail agencies to preserve regional storage.

Table 6-1. DWR 7-5W Five-Year Drought Risk Assessment (AF)

Category	2026	2027	2028	2029	2030
Total Water Use (Demand)	76,433	71,034	85,626	78,438	73,219
Total Supplies	76,433	71,034	85,626	78,438	73,219
Surplus/Shortfall without WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP – Supply Augmentation Benefit	0	0	0	0	0
WSCP – Use Reduction Savings Benefit	0	0	0	0	0
Revised Surplus/(Shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP Action	**0%**	**0%**	**0%**	**0%**	**0%**

7. Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) is a strategic plan developed by TVMWD to proactively manage and respond to both anticipated and unforeseen water shortages. A water shortage is defined as a condition in which available water supplies are inadequate to meet expected customer demand at a specific point in time. Such shortages may result from various factors, including but not limited to, water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demand.

TVMWD's WSCP is a detailed approach which presents how TVMWD intends to act, or respond, in the case of an actual water shortage contingency. It outlines a process for conducting annual water supply and demand assessments and establishes clearly defined stages and response measures to respond to actual conditions. This level of preparedness enhances transparency, ensures accountability, and supports TVMWD's ability to maintain reliable water service during periods of supply disruption.

The WSCP was prepared in conjunction with the 2025 RUWMP and is presented as a standalone document that may be updated as necessary. No substantive changes have been incorporated into the 2025 WSCP compared to the 2020 version. Minor editorial updates were made for clarity and consistency; however, the content, procedures, and response actions remain relatively unchanged.

TVMWD's WSCP is included in **Part 4, Appendix A-5**.

8. Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that TVMWD has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. TVMWD met the 2025 Water Use Target through the implementation of these DMMs. TVMWD expects to continue to implement current conservation programs to encourage conservation and achieve its water use targets.

8.1. Existing Demand Management Measures

8.1.1. Public Education and Outreach

TVMWD supports and partners with MWD during mass media campaigns to benefit from MWD's extensive regional reach. TVMWD typically conducts over 15 tours annually at the Miramar Water Treatment Plant for grades 3 through college, legislative representatives, and other water agency staff members. Presentations are given to educate visitors regarding water treatment plant operations and the true significance of clean safe water. In addition, information regarding the history, administration procedures, and importance of TVMWD and water conservation is provided throughout the tour.

TVMWD hosts three Leadership Breakfasts a year to educate local officials, elected officials and the general public regarding the importance to California water. These breakfasts feature dynamic water industry leaders and discussions of regional topics related to the water industry.

TVMWD is an active member of the Conservation & Education Team (CET), headed by the Public Water Agencies Group (PWAG), which works to raise awareness among members of the public and students about the value and importance of water and address the need for water-use efficiency outreach and programs. The CET provides conservation and educational resources within the Los Angeles County.

TVMWD hosts and administers at least three MWD tours including the State Water Project, Colorado River Aqueduct, Diamond Valley Lake, or the Edmonston Pumping Plant. TVMWD also hosts at least one local event to showcase its local facilities and the improvements made throughout the year and proposed capital projects and the importance to local supplies.

Over the last five years, TVMWD has continuously implemented public education and outreach activities.

8.1.2. Regional Rebates

In addition to the DMMs discussed above, TVMWD participates in MWD's regional rebate program, the SoCal WaterSmart Program, which is available to TVMWD's residential and commercial customers. There are rebates available for indoor plumbing including high-efficiency clothes washers and toilets. Rebates are also available for outdoor plumbing include those for weather-based irrigation controllers, rotating sprinkler nozzles, and replacement of irrigated lawn with drought tolerant plants or other approved landscape options.

These programs have been continuously in effect for the last five years. TVMWD plans to continue implementation of these programs to promote water conservation.

8.2. Asset Management

TVMWD has developed an asset management program for its major infrastructure including its distribution system. The plan includes conducting regular distribution system maintenance and/or inspection and making improvements to and/or repairs/replacement of assets as needed. TVMWD responds to repairs as needed. TVMWD may implement GIS mapping with a structured improvement and repair program. TVMWD also prepares an annual “Strategic Plan” report which identifies the five-year capital improvement projects and costs (including maintenance and improvement projects) necessary to operate TVMWD’s facilities.

All of TVMWD’s connections with its member agencies are fully metered to accurately track water sales (demands). TVMWD performs regular calibration/testing and replacement/repairs of its meters to ensure meter accuracy and to prevent "real losses" in the wholesale system. TVMWD has continuously metered all connections over the last five years.

8.3. Wholesale Supplier Assistance Program

TVMWD conducts public education and outreach efforts to assist and support its member agencies, including partnering with MWD on mass media campaigns promoting water conservation, school education programs, newsletters, informative websites, online tools, press releases, and newspaper articles.

TVMWD employs two staff members that are responsible for public outreach and coordination with TVMWD’s member agencies, MWD, local schools, and the public to encourage conservation and promote/support public awareness and participation. TVMWD provides funding in its annual budget to support these activities.

As a wholesaler, TVMWD participates in assistance programs to its retail member agencies including the conservation programs identified in the sections above. Three Valley’s actively helps its retail member agencies identify, apply for, and secure state and federal grant funding (e.g., WaterSMART grants) for local water efficiency, turf removal, and leak detection projects. TVMWD utilizes allocated funds from MWD to assist the member agencies in promoting conservation programs, water saving devices, rebate programs, educational forums, and other efforts to reduce water demand. TVMWD provides financial incentives for water conservation through retrofit and rebate programs that replace high water-use fixtures with efficient water-use fixtures. TVMWD also provides support through available staff assigned to direct conservation measures.

Over the last five years, the City has continuously implemented the activities described here each year.

9. Adoption, Submittal, and Implementation

This section describes TVMWD's process for adopting, submitting, and implementing the 2025 RUWMP and WSCP.

9.1. Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2025 UWMPs are part of the 2025 RUWMP to all cities and counties and other stakeholders within the region that that 2025 RUWMP is being prepared. This notice was sent at least 60 days prior to TVMWD's public hearing. The recipients are identified in **Part 1 Chapter 1** of the 2025 RUWMP and include all cities and counties within the TVMWD service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

TVMWD provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4, Appendix A-2**.

9.2. Public Hearing and Adoption

TVMWD held a public hearing on **June 3, 2026** to hear public comments and consider adopting this 2025 RUWMP and TVMWD's WSCP. As part of the public hearing, TVMWD provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2025 RUWMP took place before the adoption of the Plan, which allowed TVMWD the opportunity to modify the 2025 RUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

TVMWD adoption resolution for the 2025 RUWMP and TVMWD's WSCP is included in **Part 4, Appendix A-3.**

9.3. Plan Submittal

TVMWD will submit the 2025 RUWMP and TVMWD's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2025 RUWMP submittal to DWR will be done electronically through DWR's "Water Use Efficiency (WUE) Data Portal" website. The complete set of DWR submittal tables for TVMWD is included in **Part 4, Appendix A-4.**

9.4. Public Availability

Within 30 days of submitting its Plan to DWR, TVMWD will make the 2025 RUWMP and TVMWD's WSCP available for public review. Copies will be accessible during normal business hours at the TVMWD Office and posted on TVMWD's website for public viewing.

9.5. Amending an Adopted UWMP or WSCP

If the adopted 2025 RUWMP or TVMWD's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 2: Local Agency Urban Water Management Plans

FINAL

2025 RUWMP

JUNE 2026

Part 2 Chapter 2: City of Glendora 2025 Urban Water Management Plan



Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Part 4 of the 2025 RUMWP **Appendix B** contains Agency Supporting Information.

Acronyms and Abbreviations

Acronym	Description
AB1668	Assembly Bill 1668
AF	Acre-feet
AFY	acre-feet per year
AWWA	American Water Works Association
CEC	Contaminants of Emerging Concern
cfs	cubic feet per second
CIC	Covina Irrigating Company
CII	Commercial, Industrial, and Institutional
City	City of Glendora
CRA	Colorado River Aqueduct
CVWC	Covina Valley Water Company
CWC	California Water Code
CWOL	Making Conservation a California Way of Life
DCP	Drought Contingency Plan
DIM	Dedicated Irrigation Meters
DMM	demand management measure
DRA	Drought Risk Assessment
DWR	California Department of Water Resources
DWR	Department of Water Resources
FY	Fiscal year
GHG	greenhouse gas
GIS	geographic information systems
GPCD	gallons per capita per day
gpmd	gallons per mile of pipe per day
gpscd	gallons per service connection per day
GRIP	Groundwater Reliability Improvement Program
GRIP+	Groundwater Reliability Improvement Program (Plus)
GSP	Groundwater Sustainability Plan
HECW	high-efficiency clothes washing
HVAC	Heating, Ventilation, and Air Conditioning
kWh	kilowatt-hours
LACSD	Los Angeles County Sanitation Districts
MAF	million acre-feet
MGD	million gallons per day
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
PFAS	Per- and polyfluoroalkyl substances
PHET	premium high-efficiency toilets
RHNA	Regional Housing Needs Assessment

RUWMP	Regional Urban Water Management Plan
SB X7-7	Senate Bill X7-7
SB606	Senate Bill 606
SBX7-7	Senate Bill 7 of the 2009 Special Session
SCAG	Southern California Association of Governments
SGMA	Sustainable Groundwater Management Act
SJCWRP	San Jose Creek Water Reclamation Plant
SWP	State Water Project
UWMP	Urban Water Management Plan
UWUO	Urban Water Use Objectives
VHWC	Valencia Heights Water Company
VOC	Volatile Organic Compounds
WRMP	Water Resources Master Plan
WSCP	Water Shortage Contingency Plan
WUE	Water Use Efficiency
WWTP	Wastewater Treatment Plant

Individual UWMP

This chapter describes information specific to the City of Glendora (City), including its supplies, demands, and water use efficiency programs. The information and analysis provided in this chapter supplements the regional information presented in **Part 1 of the 2025 Regional Urban Water Management Plan (RUWMP)** and is provided to fulfill the City of Glendora's reporting requirements for 2025 under the UWMP Act.

The regional analyses described in Part 1 (Regional Context) of the 2025 RUWMP were conducted using a consistent analytical framework, assumptions, and methodologies that are directly applicable to the City of Glendora. The City relies on Part 1 of the RUWMP for the lay description, regional water supply availability, and the underlying technical methodology used to evaluate water supply reliability under normal, single dry-year, multiple dry-year, and five-year drought stress-test conditions.

The water supply reliability assessment and Drought Risk Assessment (DRA) applicable to the City's Urban Water Management Plan (UWMP) are presented in plain language in Part 1 of the 2025 RUWMP, specifically within Chapter 5.

Building upon that regional foundation, the City-specific supply and demand comparisons are presented in the tables within this UWMP. Unless otherwise noted, the conclusions of the regional water supply reliability assessment and DRA are directly applicable to the City and satisfy the requirements of the Urban Water Management Planning Act and the 2025 UWMP Guidebook. A completed DWR UWMP Compliance Checklist for the City is provided in **Part 4, Appendix B-1**.

1. System Description

This section describes the City's water system, service area, population demographics, local climate, and land uses.

The City was founded in 1887 and was officially incorporated in 1911. It is located at the base of the San Gabriel Mountains, in the eastern portion of Los Angeles County, approximately 30 miles from downtown Los Angeles. The City's service area covers approximately 11 square miles and is bounded by the Cities of Azusa to the west, Covina to the south and San Dimas and unincorporated portions of Los Angeles County to the east. The location of the City's service area is shown in **Figure 1-1**.

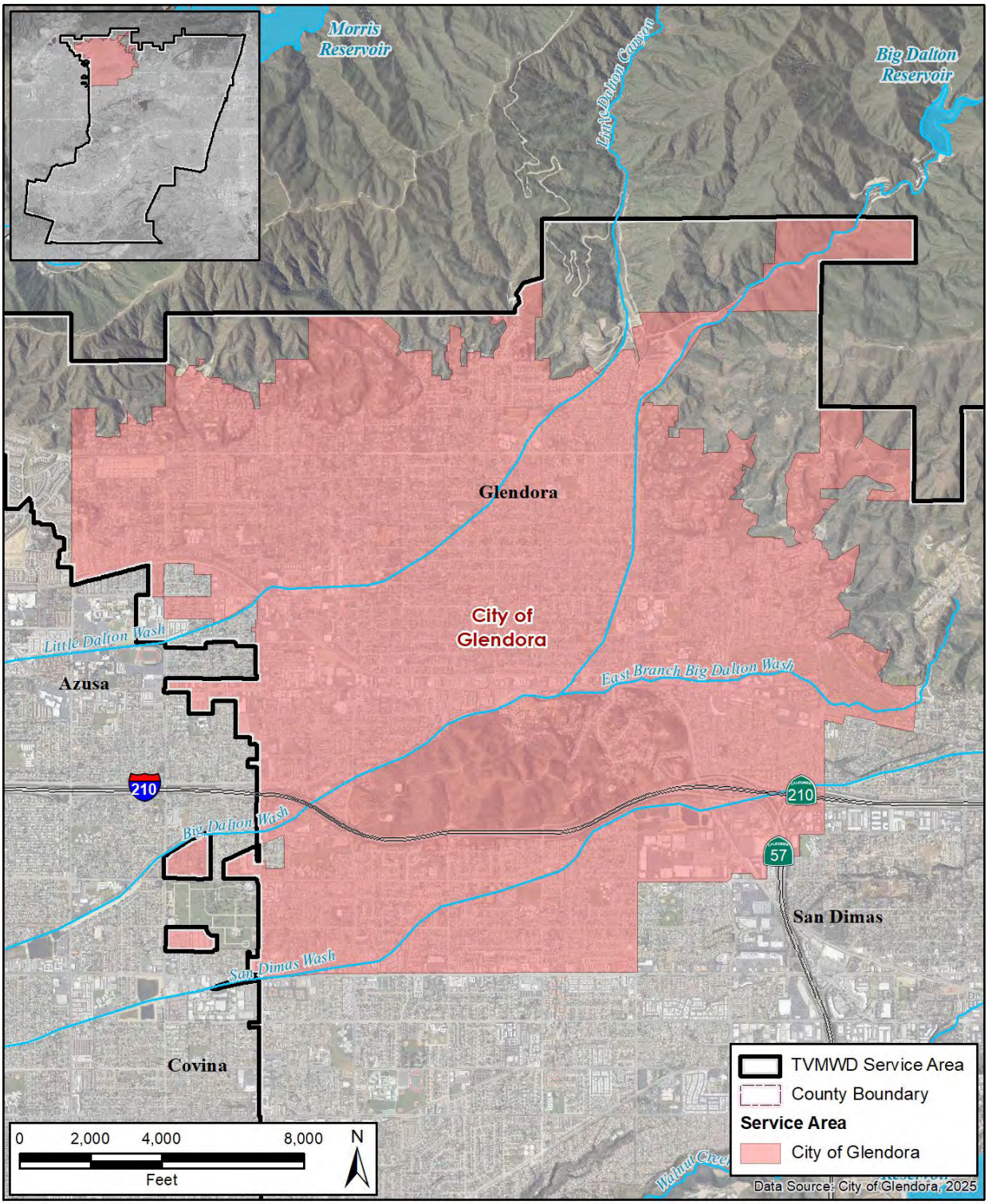
The City is governed by a five-member City Council. Council members are elected by district for four-year terms, and the Mayor is selected each year by vote of the Council. The City Manager is appointed by the City Council. Other City managerial positions are filled by the City Manager. The Water Division manager is directly responsible for the operation and management of the City's water system.

The City's water system is comprised of smaller water companies which historically were formed to support the citrus-producing community until the late 1950s, when agriculture gave way to large scale residential development. The City acquired the Glendora Water Company in 1915, the Glendora Independent Water Company in 1956, and the Glendora Irrigating Company in 1965.

The City's primary water supply is groundwater produced from eight active wells. Wells 5-E, 8-E, 9-E, and 12-E are located in the Upper San Gabriel Canyon Sub-basin, and Wells 2-E, 10-E, 11-E, and 13-E are located in the Glendora Sub-basin of the Main San Gabriel Basin. The City's distribution system consists of twelve pressure zones supplied by reservoirs, three zones served by hydro-pneumatic systems, and one zone supplied through a pressure-reducing station. The system elevations range from approximately 700 feet above sea level, to an elevation of 1,500 feet above sea level.

To supplement local groundwater, the City maintains three treated-water connections with Three Valleys Municipal Water District (TVMWD) for imported Metropolitan Water District of Southern California (MWD) supplies and one connection with Covina Valley Water Company (CVWC) for treated local surface water and groundwater. The City also has the capability to receive untreated imported water from TVMWD, as well as from the Upper San Gabriel Valley Municipal Water District (Upper District) to serve portions of the City's service area that lie outside the TVMWD boundary, for groundwater replenishment.

Figure 1-1. Service Area



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19Apr2026 RS

1.1. Service Area

The City of Glendora is a retail public water supplier that meets the definition of an urban water supplier with 14,053 municipal water service connections in 2024. The City's service area is shown in **Figure 1-1**. The regional climate, which includes the City's service area, is described in **Part 1 Chapter 2** of the 2025 RUWMP.

1.1.1. Population, Demographics, and Socioeconomics

Estimates of population served by the City are based on the 2020 U.S. Census Bureau and the Southern California Association of Governments (SCAG) (Southern California Association of Governments, 2024). A geographic information systems (GIS) analysis of 2020 Census data was used to determine the City's 2020 service area population, which was 45,710. The 2020 population and the number of residential connections served by the City in 2020 were used to derive a 2020 persons per residential connection factor of 3.3. This factor was then multiplied by the City's number of residential connections in 2025 to estimate the 2025 population served by the City. To project the population served by the City from 2030 to 2050, average annual population growth rates from SCAG projections were applied to this 2025 estimate. A GIS analysis of SCAG projection data was used to determine the SCAG growth rate specific to the City's service area. SCAG projected an increase in population from 2019 to 2035 averaging 0.15% per year and from 2035 to 2050 averaging 0.03% per year. Estimated current and projected populations of the City's service area are included in **Table 1-1**.

Table 1-1. Current and Projected Population

Population Served	2025	2030	2035	2040	2045	2050
Total	45,593	45,943	46,294	46,368	46,441	46,515

The estimated 2025 and projected future number of households and employees within the service area were estimated using the same approach as population. SCAG projected an increase in households from 2019 to 2035 averaging 0.54% per year and from 2035 to 2050 averaging 0.12% per year. SCAG projected an increase in employment from 2019 to 2035 averaging 0.16% per year and from 2035 to 2050 averaging 0.05% per year, as shown in **Table 1-2**.

According to U.S. Census Bureau QuickFacts from 2024, the median household income in the City is $113,569. The City's poverty rate is 7%. The City is 47% white alone, 12% Asian alone, 3% black alone, 22% two or more races, and 39% Hispanic or Latino. The average commute to work for workers at least 16 years of age is 33 minutes, which indicates that most jobs are local (United States Census Bureau, 2024). According to 2024 U.S. Census Bureau QuickFacts, the City's population is made up of 17% of seniors (65 years and over), 22% of persons under 18 years, and 5% of persons under 5 years. (United States Census Bureau, 2024). **Table 1-2** provides employment and household projections for the City's water service area based on SCAG GIS data intersected with the water service area.

Table 1-2. SCAG Household and Employment Projections for Water Service Area

Category	2025	2030	2035	2040	2045	2050
Households	16,886	17,341	17,796	17,904	18,012	18,120
Employees	19,466	19,623	19,781	19,830	19,878	19,927

1.1.2. Land Use

Per the Fiscal Year (FY) 2024-2025 Three Valleys Municipal Water District Assessed Service Area by Land Use, the City of Glendora's land use distribution by parcel count is as follows:

- Single-Family Residential: 81%
- Multi-Family Residential and Condominiums: 12%
- Mobile Homes: <1%
- Commercial: 3%
- Churches: <1%
- Industrial: 1%
- Recreational Camping Facilities: <1%
- Vacant Residential: 3%
- Vacant Non-Residential: 1%

2. Water Use

This section describes the current and projected water uses within the City's service area.

2.1. Water Use by Sector

2.1.1. Water Use Sectors Listed in Water Code

Water suppliers are required to identify water uses to the extent that records are available, for at least each of the water use sectors identified in CWC 10631(d) to assist in the water demand projections.

The City serves the following water uses:

Single Family Residential

Single family residential customers are typically on a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.

Multi-Family Residential

Multi-family residential customers are typically multiple dwelling units within one building or several buildings within one complex.

Landscape Irrigation

City tracks the water use for landscape irrigation.

Commercial/Institutional

The City tracks commercial and institutional customer water uses as one.

Government

Government water customers are typically public services, such as higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

Losses

Distribution system water losses are the water losses from the point of water entry to the distribution system to the delivery point to the customer's system. Water losses are discussed in **Section 2.1.3**.

The number of active connections is shown in **Table 2-1**.

Table 2-1. Fiscal Year 2021-2025 Connections by Customer Class

Customer Class	2021	2022	2023	2024	2025
Residential – Single Family	12,906	12,973	12,973	12,973	12,243
Residential – Multi-Family	391	222	222	222	222
Landscape Irrigation	47	42	42	42	58
Industrial	-	-	-	-	32
Commercial	706	816	816	816	879
Agricultural	-	-	-	-	-
Total	**14,050**	**14,053**	**14,053**	**14,053**	**13,434**

2.1.2. Past and Current Water Use

The City serves potable water for a variety of uses, as summarized in **Table 2-2**. Over the past five years, the City served an average of 8,373 AFY of potable water. In 2025, 81% of the total potable water deliveries were to residential customers. The City has no current recycled water demands. **Table 2-2** shows the annual volume of potable water used by each customer class for 2025.

Table 2-2. DWR 4-1R Actual Demands for Water, 2025, AFY

Use Type	Potable or Non-Potable (*optional*)	2025 Volume
Single Family	Potable	6,710
Multi-Family	Potable	445
Commercial	Potable	1,161
Landscape	Potable	343
Sales to other agencies	Potable	18
Distribution System Water Loss	Potable	1,436
	Total	**10,113**

2.1.3. Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. The City monitors its water loss and prepares an annual American Water Works Association (AWWA) Water Audit to estimate the volume of water loss. The City reports their AWWA Water Audit using a FY calendar. The City has submitted all required water loss audits to the State, as shown in **Table 2-3.** Copies of the City's recent AWWA audits are provided in **Part 4, Appendix B-6**.

Table 2-3. DWR 4-5R Month Water Loss Audit Reporting

Public Water System ID # Reported in DWR Table 2-1R	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910044	2020	Yes
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes
	2025	Yes

DWR Notes:

2020 AWWA: Glendora City of - Validated Water Audit - FY19-20.xlsx
2021 AWWA: City of Glendora FY 20-21 - Validated Audit- Final.xlsx
2022 AWWA: Glendora City of - Validated Audit FY22.xlsx
2023 AWWA: Glendora - FY2023 Validated Audit- FINAL.xlsx
2024 AWWA: Glendora FY2024 - Validated Audit- Final.xlsx
2025 AWWA: Glendora-FY2025- Validated - Final.xlsx

CWC Section 10608.34 required the State Water Resources Control Board (State Board) to develop water loss performance standards for urban retail water suppliers to minimize water waste through system leaks. Water loss performance standards were developed through a rulemaking that became effective in 2023. Under the regulations, each supplier will be required to comply, by 2028, with an individualized volumetric water loss standard based on real loss, using the economic model developed by the State Board and the supplier's own unique data. Real loss is the physical loss of water from water distribution systems, as opposed to apparent losses, which are revenue losses due to meter inaccuracies, billing errors or unauthorized consumption. A supplier's baseline water loss is calculated as the average water loss from at least 3 of the 4 water loss audits from 2017 – 2020. The real water loss performance standard is based on gallons per service connection per day (gpscd), or gallons per mile of pipe per day (gpmd), depending on how the supplier reports real loss. Post-2028 compliance with volumetric water loss standards will be assessed every three years based on the average of the supplier's real loss from the preceding three years, with an allowed variation of 5 gallons per connection per day above the supplier's water loss standard. Apparent loss standards are equal to the baseline apparent loss and compliance is evaluated at the same time as compliance with the Real Water Loss Performance Standard.

Although the compliance period has not yet started, CWC Section 10631 (d)(3)(C) requires water suppliers to provide data in the UWMP to show whether the supplier met its State Board water loss performance standard.

Over the last five years, the City's water losses have ranged from 10% to 19% when calculated as the difference between billed consumption and total production. To project the water loss component of future demands, the City assumed future water losses will be approximately 14% of total customer water use. Calculated water losses are shown in **Table 2-4**.

Based on data released by the State on January 30, 2026, the supplier's baseline for real water loss is 52.8 gpscd and the real water loss standard is 20.3 gpscd, and the apparent loss standard is the baseline of 13.3 gpscd. No reduction from the baseline is required to meet the water loss standard by 2028. As

shown in **Table 2-5**, based on the most recent water loss audit from 2024, the City has not yet met the real water loss performance standard, but is working toward that goal by 2028. **Section 8.1.5** discusses City's programs to assess and manage distribution system real loss.

Table 2-4. Calculated Water Loss

Water Loss	2021	2022	2023	2024	2025
Calculated Water Loss	2,140	1,032	1,462	966	1,243
% Water Loss	19%	10%	18%	11%	12%

Table 2-5. DWR 4-6R Progress Towards 2028 Water Loss Standard

Public System ID # Reported in Submittal Table 2-1R	Did the Water Board Calculate a Water Loss Standard for this Public System?	2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Standard	Number of Units	Volume of Total Real Water Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Real Water Loss per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Apparent Water Loss per Unit per Day
CA1910044	Yes	20.3	gpscd	13,816	1,660	107.3	13.3	gpscd	13,816	121	7.8

2.2. Projected Water Use

The "Making Conservation a California Way of Life" Regulation (CWOL Regulation) establishes unique water budget-based Urban Water Use Objectives (UWUO) for each urban retail water supplier in the State. The CWOL Regulation requires suppliers to calculate an annual UWUO consisting of these core components:

> UWUO = Residential Indoor Water Use Budget + Residential Outdoor Water Use Budget + Commercial, Industrial, and Institutional (CII) Dedicated Irrigation Meters (DIM) Outdoor Water Use Budget + Real Water Loss Budget

DWR and the State Board have developed an annual reporting framework, tools, and guidance for calculating the UWUO and comparing it to the actual use for that year. The State Board's "Water Use Objective Exploration Tool" allows users to enter varying efficiency standards and baseline year(s) of input data to calculate and visualize a comparison of historic demand to the UWUO with selected standards. The State Board's "Annual UWUO and Water Use Report" tool pre-populates input data and standards for the given reporting year. To project demands for this UWMP, a demand tool that aligns with the framework, data, and calculations of the State Board's tools was used and updated to allow for forecasting future years' water demand considering future efficiency standards, supplier input data, and growth assumptions. Depending on the annual fluctuations of input data, a supplier's estimated UWUO reduction needed by 2040 can exceed 30% relative to the baseline usage. According to the CWOL Regulation, suppliers who must achieve over a 30% reduction in their 2040 UWUO compared to baseline usage are permitted to follow an alternative compliance method. This alternative method requires an annual decrease of 2% in gallons per capita per day (GPCD) compared to the baseline usage.

Based on the demand analysis for this UWMP, the City anticipates a reduction of more than 40% will be needed to meet the UWUO. While the City intends to meet the UWUO, it was also considered that demands may continue in alignment with historic patterns initially and take more time than anticipated to reach direct alignment with the UWUO. Therefore, demands used for the purposes of supply reliability planning in this UWMP are assumed to reduce by 2% per five-year planning period from 2025, which is 198 GPCD. This results in 194 GPCD in 2030, declining by approximately 2% each subsequent five-year period until it reaching approximately 179 GPCD in 2050. Population projections, as described in **Section 1.1.1**, are applied to these GPCD values to project future demands, as shown in **Figure 2-1**. The assumed future water loss of 14% described in the previous section was applied to the subtotal of demand for all connection types to estimate future water losses. **Table 2-6** presents the projected demand by customer type through 2050 for this UWMP.

Figure 2-1. Historical and Projected Demands

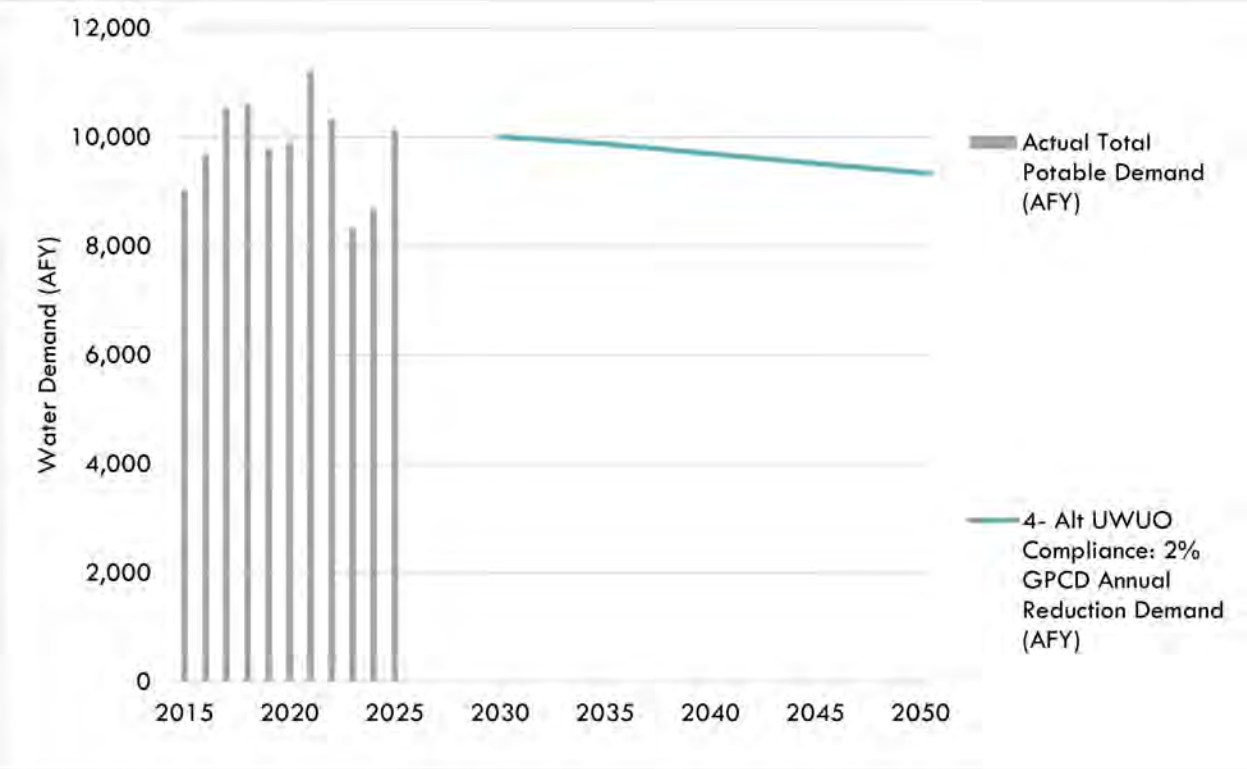


Table 2-6. DWR 4-2R Projected Demands for Water Use, AFY

Use Type	Additional Description	Level of Treatment When Delivered	Projected Water Use 2030	Projected Water Use 2035	Projected Water Use 2040	Projected Water Use 2045	Projected Water Use 2050
Single Family		Potable	6,618	6,535	6,415	6,296	6,180
Multi-Family		Potable	587	580	569	559	548
Commercial		Potable	1,185	1,170	1,148	1,127	1,107
Landscape		Potable	161	159	156	153	151
Sales to other agencies		Potable	47	46	45	45	44
Distribution System Water Loss		Potable	1,405	1,388	1,362	1,337	1,312
		Total	**10,004**	**9,878**	**9,696**	**9,517**	**9,342**

Table 2-6 and **Table 2-7** satisfy the requirement to include anticipated water conservation savings when developing future demand projections since they account for water efficiency standards set by the State for the UWUO and an alternative compliance path to reduce by 2% per five-year planning period from 2025. Conservation savings were considered and included in developing demand estimates for the next 25 years. However, the City considers projected demand to plan for supply reliability if demands continue in alignment with historic patterns rather than in direct alignment with the UWUO. The City is complying with and planning for UWUO standards as described in **Sections 3 and 8.**

Senate Bill 1087 requires that water use projections in an UWMP include projected water use associated with single family and multi-family residential housing for lower income households, as identified in the housing elements of any city, county, or city and county within the supplier's service area. The Regional Housing Needs Assessment (RHNA) establishes housing needs for each jurisdiction over the applicable planning period. SCAG adopted the 6th Cycle RHNA Allocation Plan, which covers the planning period from October 2021 through October 2029 (SCAG, March 2021). SCAG's population and household projections inform the RHNA Allocation Plan and are used in the determination and allocation of housing needs, including lower income housing, for individual jurisdictions. The growth projections in this UWMP are based on SCAG projections for the service area and therefore also incorporate the lower income housing projections. The projected demands in this UWMP represent water use from all future growth and are inclusive of water use for lower income households.

Table 2-7. DWR 4-3R Inclusion in Water Use Projections

Question	Yes or No
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included in Projections?	Yes

2.3. Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. A recent Climate Change Vulnerability Assessment utilizing data from DWR and 20 global climate models suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1, Chapter 2** of the 2025 RUWMP includes an assessment of the potential impacts of climate change.

3. SB X7-7 Compliance & Future Water Use Efficiency Requirements

This section describes compliance with the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7). The section demonstrates compliance with the 2020 SBX7-7 target and discusses future water use efficiency requirements.

3.1. Compliance and Future Water Use Efficiency Requirements

SBX7-7 was incorporated into the UWMP Act in 2009 and required that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20% by the year 2020.

SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, March 2021) specify methodologies for determining the baseline water demand, 2015 interim urban water use target and the 2020 urban water use target for the City as described in the 2020 UWMP. This section also demonstrates that the City achieved its 2020 water use target.

Table 3-1 below establishes the City's 2020 actual and 2020 target GPCD. As shown, the City met its 2020 target. Most recently, in 2025, the water use was 198 GPCD, which is well below the 2020 target of 218 GPCD.

Table 3-1. SB X7-7 2020 Target Progress

2020 Target GPCD	2020 Actual GPCD	Did Supplier Achieve Target?
218	194	Yes

New water use efficiency standards from the CWOL Regulation supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the "2018 Water Conservation Legislation." Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation, each urban retail water supplier must comply with its UWUO. DWR and the State Board have developed a reporting framework for calculating the UWUO and compliance annually with efficiency standards becoming increasingly stringent through 2040.

The demand projections in this UWMP are based on the City meeting its estimated future UWUO, as described in **Section 2.2** in order to plan and implement necessary demand management measures (DMMs) (described in **Section 8**) to support meeting the UWUO. DMMs and UWUO compliance planning enhance resiliency for drought and other water shortage conditions as described in **Sections 5, 7, and 8**.

4. Water Supply

The City's primary sources for water supply include treated imported surface water purchased from the MWD through TVMWD, groundwater pumped from the Main San Gabriel Basin (Main Basin), and local treated surface water purchased from CVWC. More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2025 RUWMP.

4.1. Purchased or Imported Water

4.1.1. Three Valleys Municipal Water District

The City purchases treated imported water from MWD through TVMWD. MWD imports water from the Colorado River through the Colorado River Aqueduct (CRA), owned and operated by MWD, and the State Water Project (SWP), which utilizes the California Aqueduct for transmission to Southern California. TVMWD's member agencies can receive treated imported water from MWD's Weymouth Treatment Plant located in the City of La Verne or from TVMWD's Miramar Water Treatment Plant located in the City of Claremont.

The City's treated imported water supplies from MWD, through TVMWD, may be impacted during a multi-year drought or other conditions which limits MWD from delivering sufficient water supplies to all its member agencies, and consequently to the City. A description of this supply and its reliability is provided in **Part 1 Chapter 3** and **Part 1 Chapter 5** of the 2025 RUWMP.

4.1.2. Covina Valley Water Company

The City does not use self-supplied surface water sources to meet its water demands. The City purchases treated surface water supplies from CVWC (formerly Covina Irrigation Company) (see **Part 1, Section 3.3**). CVWC sources of supply include surface water diversions from the San Gabriel River, groundwater pumped from the Main San Gabriel Basin and untreated imported water. CVWC owns the Temple Plant, which is a surface water treatment plant located near the intersection of Arrow Highway and Grand Avenue in the City of Glendora, which is used to treat the local surface water and the imported water. The Temple Plant has a capacity of approximately 10 million gallons per day (MGD).

The City owns a connection with CVWC, with a maximum capacity of 3.3 cubic feet per second (cfs) which can supply up to approximately 1,500 gallons per minute. Through this connection, the City can purchase treated surface water and groundwater. CVWC water supplies augment the City's sources of supply from the Main San Gabriel groundwater basin and treated imported water.

4.2. Groundwater

The City produces groundwater from the Main Basin. The Main Basin is a sub-basin of the San Gabriel Valley Basin. The Main Basin has been adjudicated and is managed for long-term sustainability; a

detailed hydrogeological description of the Main Basin is provided in **Part 1, Section 3.2.1** of the 2025 RUWMP.

4.2.1. Main San Gabriel Basin

The Watermaster manages the Main Basin through an Operating Safe Yield (OSY), which is determined annually based on groundwater elevations and rainfall. The City of Glendora holds a prescriptive pumping right equal to 4.75261% of the declared OSY. The City manages its pumping in accordance with Watermaster rules; if the City's water demands require pumping in excess of its OSY share, the City pays a "Replacement Water" assessment to the Watermaster, which is used to purchase untreated imported water to artificially recharge the basin. See **Part 1, Section 3.2.1** for more details regarding the Main Basin's adjudication and basin management.

Extraction Infrastructure and Historical Pumping

The City operates active groundwater production wells located throughout the service area. To maintain extraction capacity and efficiency, the City proactively manages its wellfield infrastructure. As noted in **Section 4.7**, the City is currently pursuing the rehabilitation, redrilling, or replacement of several key assets, including Wells 2, 7, 10, 11, and 14, to ensure sufficient extraction capacity to meet future demands.

Table 4-1 summarizes the City's actual groundwater production over the past five years. Pumping volumes fluctuate annually based on total system demand, the availability of surface water, and local hydrological conditions. For example, the decrease in groundwater pumping observed in 2023 (7,706 AF) reflects reduced customer demand and increased availability of supplemental supplies during an exceptionally wet hydrologic year.

Table 4-1. DWR 6-1R Groundwater Pumped Last Five Years (AF)

Groundwater Type	Location or Basin Name	2021	2022	2023	2024	2025
Alluvial Basin	Main Basin	10,709	8,646	7,706	8,103	10,099
	Total	**10,709**	**8,646**	**7,706**	**8,103**	**10,099**

4.3. Surface Water

The City does not use self-supplied surface water sources to meet its water demands. The City purchases treated surface water supplies from CVWC, as discussed in **Section 4.1**.

4.4. Stormwater

The City does not directly use stormwater to meet its water demands.

4.5. Wastewater and Recycled Water

Wastewater generated by the City is treated by Los Angeles County Sanitation Districts (LACSD). Wastewater is collected within the City's local sewer collection system. The City's local sewers tie into one of LACSD's regional trunk sewers. The regional trunk sewer lines deliver wastewater to one or more water reclamation plants owned by LACSD for treatment. The water reclamation plants are not located within the City's service area.

Wastewater is not treated or disposed within the City's service area. The water reclamation plants serving the City include the San Jose Creek Water Reclamation Plant (SJCWRP) and the A.K. Warren Water Resource Facility (formerly known as the Joint Water Pollution Control Plant). The percentage breakdown between these two plants in treating the City's wastewater is unknown. To align with current conservation realities and CWOL framework, wastewater generation is estimated utilizing the State's 2025 indoor residential water use standard of 47 GPCD (as indoor water use serves as the direct proxy for wastewater generation). Based on Glendora's 2025 population of 45,593, the estimated amount of wastewater collected by the City is approximately 2.14 MGD (about 2,400 AFY). **Table 4-2** shows existing wastewater collection and treatment at the LACSD.

The City does not have access to recycled water due to the lack of infrastructure to convey recycled water supplies to the City.

4.5.1. Potential, Current, and Projected Recycled Water Uses

The City does not use recycled water to meet its water demands. The wastewater collected from the City and treated at SJCWRP already is used by other recycled water customers that are outside of the City's service area boundaries. Subject to the availability of recycled water, the City would need to construct transmission and distribution facilities to deliver recycled water to customers within its service area.

Table 4-2. DWR 6-2R Wastewater Collected within Service Area in 2025 (AF)

Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Volume of Wastewater Collected from UWMP Service Area 2025**	**Name of Wastewater Treatment Plant (WWTP) and Place ID Number**	**Is WWTP Located Within UWMP Area?**
LACSD	Estimated	2,400 AF	SJCWRP (Place ID 260156), A.K. Warren Water Resource Facility (Place ID 234156)	No
	Total	**2,400 AF**		

4.6. Water Exchanges and Transfers

The City does not have any current or planned water exchange opportunities.

Water rights under the Main Basin Judgment are transferable by lease or purchase so long as such transfers meet the requirements of the Judgment. There is also provision for Cyclic Storage Agreements by which Parties and non-parties may store imported supplemental water in the Main Basin under such agreements with the Main Basin Watermaster pursuant to uniform rules and conditions and Court approval. The City can and does utilize the transfer opportunities available for Main Basin water when necessary.

4.7. Future Water Projects

The City obtains water from local groundwater, purchased local groundwater and surface water from CVWC, and imported surface water supplies. These water supply sources will allow the City to provide sufficient water service currently, and in the future. Although the City has no plans for future water supply projects, the City will construct new groundwater production wells to replace existing wells when necessary.

As part of the TVMWD Water Resources Master Plan (WRMP) and Drought Contingency Plan (DCP) with the member agencies, the City is currently pursuing several projects to increase water supply reliability. Future projects may include:

- Well #7 (Vosburg) Replacement to enhance well efficiency.
- North Glendora Tank Replacement, which upgrades aging infrastructure and increase storage capacity.
- Well #14 Replacement to develop a new extraction well. This project is expected to increase overall production capacity by approximately 2,000 AF.
- Turf Removal for Large Commercial and Municipal Properties for conservation and efficiency efforts. This project is expected to decrease overall demand by approximately 300 AF.
- Redrilling Well 10 and Well 11 to enhance well efficiency and which upgrades aging infrastructure.
- Pipeline Intertie Replacements to improve system interties.
- Well 2 Replacement to enhance well efficiency.
- Well rehabilitation program, to improve efficiency and capacity of all wells.

Four regional water supply projects were also identified in the WRMP and DCP effort through collaboration with TVMWD, member agencies, and regional stakeholders. These regional projects, described in **Part 1, Chapter 3**, are intended to enhance overall supply reliability for the region.

- Project 1: External Partnership with CVWC – Main Basin
- Project 2: TVMWD Groundwater Reliability Improvement Program (GRIP)

- Project 3: TVMWD Storing Water in Main San Gabriel Basin (GRIP+)
- Project 4: TVMWD–Pomona Chino Basin Conjunctive Use Exchange

As development progresses and increased demands are placed on the system, the City will determine which projects to implement.

4.8. Summary of Existing and Planned Sources of Water

The City's water supply is comprised of treated imported water, local treated surface water, and groundwater. The volume of water utilized from each source in 2025 is summarized in **Table 4-3** and projected supply is summarized in **Table 4-4**.

Table 4-3. DWR 6-8R Actual Water Supplies in 2025 (AF)

Water Supply	Additional Detail on Water Supply	2025 Actual Volume	2025 Potable or Non-Potable (*optional*)	2025 Total Entitlement (*optional*)
Groundwater (not desalinated)	Main Basin	10,099	Potable	
Purchased or Imported Water	Metropolitan Water District – TVMWD	14	Potable	
Purchased or Imported Water	Covina Valley Water Company	0	Potable	
-	**Total**	**10,113**		-

Supply Projection Methodology

To project future water supplies accurately and conservatively, the City, in coordination with TVMWD, evaluated supply projection methodologies. Rather than projecting supplies based on maximum legal entitlements or absolute physical extraction capacity, the City opted to utilize a "Real Water" (Utilization-Based) approach. This approach grounds future projections in empirical operational reality. The methodology utilized a baseline representing the City's average local supply utilization over the most recent five-year period (2021–2025), which was 9,686 acre-feet per year (AFY). This baseline smoothed out historically dry years (e.g., 2021) and historically wet years (e.g., 2023).

As described in **Part 1, Section 5.1.2**, to calculate the projected supplies shown in **Table 4-4**, the following steps were applied:

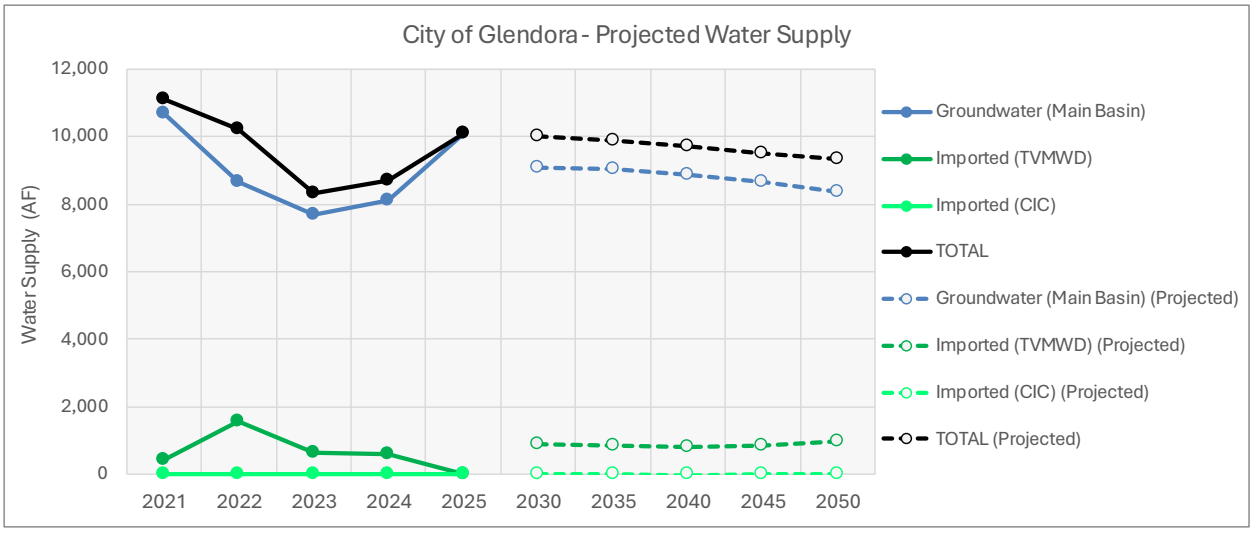
1. **Climate Change Adjustments:** Specific climate change vulnerability factors, derived from TVMWD's 2024 Climate Vulnerability Analysis, were applied to the 2021-2025 baseline local agency supplies (Main Basin groundwater and CVWC purchased water) to forecast anticipated local yields through 2050.
2. **Imported Water Reliance:** The projected local supplies were then compared against the City's projected demand. Any projected unmet demand is assumed to be fulfilled by imported water purchases from TVMWD.

As shown in **Table 4-4** and **Figure 4-1**, the City's reliance on the Main Basin is projected to decrease slightly over time under a climate change planning scenario that models potential impacts to local hydrology. Under this specific scenario, imported water purchases from TVMWD are projected to increase modestly to balance the City's overall supply portfolio and meet customer demands. It is important to note that these projections are intended for long-term vulnerability planning purposes only; they do not incorporate future adaptation or mitigation strategies currently being developed or implemented at the regional level. Future actions, such as those identified in the DCP, are specifically designed to reduce or offset these potential climate-related impacts to local groundwater supplies.

Table 4-4. DWR 6-9R Projected Water Supplies (AF)

Water Supply	Additional Detail on Water Supply	2030	2035	2040	2045	2050
Groundwater (not desalinated)	Main Basin	9,090	9,018	8,864	8,642	8,357
Purchased or Imported Water	Metropolitan Water District – TVMWD	906	853	825	867	977
Purchased or Imported Water	Covina Valley Water Company	8	8	7	8	9
	Total	**10,004**	**9,878**	**9,696**	**9,517**	**9,342**

Figure 4-1. The City Projected Supply and Demand Comparison (AF)



4.9. Energy Intensity of Water Supplies

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHG) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.

- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

The information used to calculate the estimated energy intensity associated with the City's water system is provided below. The energy intensity information is based on readily obtainable energy and water use data for the following water management processes: 1) extraction or diversion of water supplies; 2) placement into storage; 3) conveyance to distribution; 4) treatment; and 5) water system distribution.

The City has tabulated its energy intensity using readily obtainable energy consumption data obtained from monthly electricity bills from Southern California Edison (SCE) and Azusa Light & Water for the whole water system and the corresponding water use data obtained from available water meter readings. The City has reported the energy intensity associated with the water management processes which occur within its operational control. Because the City does not track individual energy usage for each water management process identified above, the City has estimated the energy intensity using the a "total utility approach" (i.e. sum of all water management processes). The total energy consumed was approximately 7,927,039 kWh during FY 2024-25. Although the total energy consumption reported includes electricity usage for general administration (e.g. at the City's headquarters) which is not associated with any water management processes, the general administration energy usage is considered negligible compared to overall water system use and has not been netted out.

The total volume of water entering the potable water system was approximately 10,113 AF during FY 2024-25 and is consistent with the total volume of water provided in Table 2-2.

The total energy intensity associated with the City's water management processes is estimated at 783.85 kWh/AF.

5. Water Service Reliability Assessment

This section considers the City's water supply reliability during normal years, single dry years, and up to five consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from the City's current source of supply through 2050.

5.1. Constraints on Water Sources

While the City maintains a highly reliable water portfolio, its supply sources are subject to various environmental, regulatory, and infrastructural constraints. A comprehensive analysis of regional water supply constraints is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the 2025 RUWMP.

For the City of Glendora specifically, the primary constraints on water sources include:

- **SWP-Dependent Infrastructure:** Due to pipeline elevations and regional network hydraulics, the City of Glendora is situated within a "SWP-Dependent Area." This means the City is served by the Rialto Pipeline and TVMWD's Miramar Water Treatment Plant, which cannot physically receive treated Colorado River water from the CRA and rely entirely on SWP flows. As detailed in **Part 1, Section 3.1.2**, MWD typically buffers SWP allocation cuts using regional storage and its Water Supply Allocation Plan (WSAP). However, during severe multi-year droughts, physical limitations in delivering stored water to the Rialto Pipeline can trigger localized shortages and emergency mandates (such as the 2022 SWP-Dependent Area Emergency Conservation Program). Consequently, during severe multi-year droughts when SWP allocations are drastically reduced by the State, the City relies more on its local groundwater reserves and CVWC purchased supplies to offset imported water constraints.
- **Groundwater Quality:** Contaminants of Emerging Concern (CECs), such as PFAS, as well as legacy Volatile Organic Compounds (VOCs) in the Main San Gabriel Basin, can force the City to temporarily remove active extraction wells from service. To mitigate this constraint, the City is actively investing in replacement projects as detailed in **Section 4.7**.
- **Climate Change Impacts on Surface Water:** The City's purchased supply from CVWC relies partially on San Gabriel River diversions. As identified in **Part 1, Section 2.5**, this source is highly susceptible to climate-driven volatility, including shorter rainy seasons and severe post-wildfire turbidity, which can temporarily halt treatment operations.

5.2. Year Type Characterization

In general, groundwater is less vulnerable to seasonal and climatic changes than surface water (i.e. local and imported) supplies. The Main San Gabriel Basin Watermaster monitors groundwater levels and implements supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1 Chapter 3**.

Because the City's baseline years are a mix of different hydrologic conditions, it is important to note how the City's supply strategy adapts to dry years. The City's primary source of supply, the Main San Gabriel Basin, has a variable OSY that may decline during dry periods. However, under the basin's adjudication framework, the City can legally and physically continue to produce the water it needs to meet elevated dry-year demands by paying Replacement Water assessments for any production that exceeds its rights. As a result, the City's operational supply strategy is not significantly different in dry years compared to normal years. The changes in the City's projected baseline supply over time are primarily driven by long-term climate change factors (as detailed in **Section 4.8**) and planned infrastructure projects.

Per UWMP requirements, the City has evaluated reliability for an average year, single dry year, and a five consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** The single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** The driest five-year historical sequence for the supplier, which may be the lowest average water supply available for five years in a row.

To characterize these year types, the City evaluated historical supply and demand data. For the purposes of this 2025 UWMP, the City established a "Normal Year" baseline using the average annual supply and demand from 2021 through 2025.

Because water demand in the City typically increases during dry years due to elevated outdoor irrigation needs, the "Single Dry Year" and "Five-Year Drought" scenarios are modeled using historical years where production peaked to meet elevated drought demands. **Table 5-1** summarizes the base years utilized for this analysis and the corresponding volume of water available/utilized as a percentage of the average year.

Table 5-1. DWR 7-1R Basis of Water Year Data

Year Type	Base Year (FY)	Volume Available (AF)	% of Average Supply
Average Year	2021-2025	9,686	100%
Single-Dry Year	2021	11,094	115%
Consecutive Dry Years 1st Year	2018	10,833	112%
Consecutive Dry Years 2nd Year	2019	9,847	102%
Consecutive Dry Years 3rd Year	2020	9,898	102%
Consecutive Dry Years 4th Year	2021	11,094	115%
Consecutive Dry Years 5th Year	2022	10,213	105%

5.3. Water Service Reliability

The results of the reliability assessment are summarized below.

As established in **Section 4.8** and **Part 1, Section 5.1.2**, the City utilized the "Real Water" (Utilization-Based) methodology to project its future supplies. Under this operational approach, the City projects its local groundwater and CVWC purchased supplies based on historical averages adjusted for climate change. Any remaining unmet demand is fulfilled by purchasing imported water from TVMWD.

The City's projected "Normal Year" water demands over the next 25 years were developed using a demand-per-connection approach as discussed in **Section 4.8** and **Section 5.2**. This approach utilizes a baseline period of 2025 to approximate normal demand patterns, projects future connections based on SCAG growth rates, and incorporates anticipated reductions due to passive conservation and compliance with the new "Making Conservation a California Way of Life" regulatory framework.

To estimate projected demands during drought conditions, the City utilized a historical ratio methodology. Because water demand in Southern California typically increases during hot, dry periods due to elevated outdoor irrigation needs, the City analyzed the ratio of total water utilized during historical dry periods compared to a historical average year.

Based on the City's operational data, the historical average year baseline was established using the five-year period of FY 2021–2025 (averaging 9,686 AF).

- **Single Dry Year Scaling:** The ratio of water utilized during the historical single dry year of FY 2021 (11,094 AF) to the historical average (9,686 AF) yielded a scaling factor of 115%. This 115% factor was applied to the projected normal year demands to estimate the City's projected water demands during future single dry years.
- **Five-Year Drought Scaling:** To estimate demands during a five-consecutive-year drought, the City utilized the historical drought sequence from FY 2018 through FY 2022. The ratio of water utilized in each of these years (10,833 AF, 9,847 AF, 9,898 AF, 11,094 AF, and 10,213 AF, respectively) compared to the historical average yielded scaling factors of **112%, 102%, 102%, 115%, and 105%** for years one through five of the drought sequence, respectively. These factors were applied to the projected normal year demands to forecast future multi-year drought demands.

Because TVMWD and MWD have demonstrated 100% supply reliability to meet wholesale demands through 2050 (supported by MWD's 2025 UWMP supply reliability analysis (MWD, 2026)), the City's total supply is projected to meet its total projected demand across all hydrologic scenarios. Consequently, the difference between supply and demand in the tables below is zero, reflecting a fully reliable water portfolio through the 2050 planning horizon.

Table 5-2, **Table 5-3**, and **Table 5-4** summarize the City's projected water supplies and demands over the next 25 years in five-year increments. These tables demonstrate the City can reliably meet elevated water demands during normal years, single dry years, and five-consecutive-year drought periods over the next 25 years.

Table 5-2. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	10,004	9,878	9,696	9,517	9,342
Demand totals	10,004	9,878	9,696	9,517	9,342
Difference	**0**	**0**	**0**	**0**	**0**

Table 5-3. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	11,458	11,314	11,105	10,900	10,700
Demand totals	11,458	11,314	11,105	10,900	10,700
Difference	**0**	**0**	**0**	**0**	**0**

Table 5-4. DWR 7-4R Multiple Dry Years Supply and Demand Comparison

Year	Totals	2030	2035	2040	2045	2050
First Year	Supply Totals	11,188	11,047	10,844	10,644	10,448
	Demand Totals	11,188	11,047	10,844	10,644	10,448
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	10,170	10,042	9,857	9,675	9,497
	Demand Totals	10,170	10,042	9,857	9,675	9,497
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	10,223	10,094	9,908	9,725	9,546
	Demand Totals	10,223	10,094	9,908	9,725	9,546
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	11,458	11,314	11,105	10,900	10,700
	Demand Totals	11,458	11,314	11,105	10,900	10,700
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	10,548	10,415	10,223	10,035	9,850
	Demand Totals	10,548	10,415	10,223	10,035	9,850
	Difference	**0**	**0**	**0**	**0**	**0**

6. Drought Risk Assessment

The Drought Risk Assessment (DRA) is an analysis required for the 2025 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2026. While Section 5 evaluated long-term reliability through 2050, the DRA serves as an immediate stress test, focusing specifically on the five-year period from 2026 through 2030. The purpose of this assessment is to determine if the City anticipates any supply shortages in the immediate future that would necessitate triggering mandatory demand reduction measures outlined in the Water Shortage Contingency Plan.

6.1. Data, Methods, and Basis for Water Shortage Conditions

To conduct the DRA, the City utilized the same "Real Water" supply methodology and historical drought scaling factors detailed in **Sections 4.8** and **5**. The assessment simulates a severe, five-consecutive-year drought mirroring the hydrology of Fiscal Years 2018 through 2022.

Because hot, dry weather drives increases in outdoor irrigation, the City's unconstrained demands are projected to scale up significantly during this period (up to 115% of average baseline demand, as established in **Section 0**). The DRA tests whether the City's local groundwater and imported water portfolios can sustain these elevated demands over the next five years without natural replenishment.

6.2. DRA Water Source Reliability

The City's near-term reliability is highly secure due to the active management of the Main San Gabriel Basin and the unprecedented storage reserves held by its wholesale providers.

Entering the 2026–2030 DRA period, MWD holds nearly 4 million acre-feet (MAF) of water in regional storage, which is a near-record high. MWD’s 2025 UWMP DRA modeling confirms that even if the SWP and CRA experience five consecutive years of severe constraint, MWD has sufficient stored reserves to meet all wholesale member agency demands without shortage allocations through 2030. Consequently, TVMWD can reliably supply the City with imported water to cover any deficits caused by constrained local groundwater production.

6.3. Total Water Supply and Use Comparison

Table 6-1 details the DRA for the 2026–2030 period. As demonstrated in the table, the City's projected supplies are sufficient to fully and consistently meet the elevated, unconstrained demands for every year of the five-year drought sequence.

Because the City anticipates a supply surplus (a difference of zero) across all five years of the near-term drought scenario, the City does not currently project a need to implement mandatory, extraordinary conservation measures or trigger advanced stages of its WSCP due to supply shortages. However, the City remains committed to ongoing water conservation and will continue to enforce standard water waste prohibitions to preserve regional storage.

Table 6-1. DWR 7-5 Five-Year Drought Risk Assessment (AF)

Category	2026	2027	2028	2029	2030
Total Water Use (Demand)	11,188	10,170	10,223	11,458	10,548
Total Supplies	11,188	10,170	10,223	11,458	10,548
Surplus/Shortfall without WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP – Supply Augmentation Benefit	0	0	0	0	0
WSCP – Use Reduction Savings Benefit	0	0	0	0	0
Revised Surplus/(Shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP Action	**0%**	**0%**	**0%**	**0%**	**0%**

7. Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) is a strategic plan developed by the City to proactively manage and respond to both anticipated and unforeseen water shortages. A water shortage is defined as a condition in which available water supplies are inadequate to meet expected customer demand at a specific point in time. Such shortages may result from various factors, including but not limited to, water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demand.

The City's WSCP is a detailed approach which presents how the City intends to act, or respond, in the case of an actual water shortage. It outlines a process for conducting annual water supply and demand assessments and establishes clearly defined stages and response measures to respond to actual conditions. This level of preparedness enhances transparency, ensures accountability, and supports the City's ability to maintain reliable water service during periods of supply disruption.

The WSCP was prepared in conjunction with the 2025 RUWMP and is presented as a standalone document that may be updated as necessary. No substantive changes have been incorporated into the 2025 WSCP compared to the 2020 version. Minor editorial updates were made for clarity and consistency; however, the content, procedures, and response actions remain relatively unchanged. As of 2025, the City is operating under an adjusted Stage 3 WSCP, adopted by the City Council in May 2022.

The City's WSCP is included in **Part 4, Appendix B-7**.

8. Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that Glendora has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. The City met the 2025 Water Use Target through the implementation of these DMMs. The City expects to continue to implement current DMMs to encourage conservation and achieve its water use targets.

8.1. Existing Demand Management Measures

8.1.1. Water Waste Prevention Ordinances

The City adopted a Drought Regulations and Water Conservation Standards Ordinance (Ordinance 1585) in April 1991. The ordinance states that it shall be a violation for any consumer or account holder to waste any water obtained from or through the water distribution facilities of the City. Waste is defined as any excessive, unnecessary or unwarranted use of water, including but not limited to any use which causes unnecessary runoff beyond the boundaries of any property as served by its meter and any failure to repair as soon as reasonably possible any leak or rupture in any water pipes, faucets, valves, plumbing fixtures or other water service appliances. In May 2008, the City adopted Ordinance 1895 which addressed water conservation, identifying two phases of implementation and restricting specific uses of water during a declared water shortage. In August 2009, the City adopted Ordinance 1925 to amend the municipal code for mandatory conservation measures. Ordinance 1925 provided additional actions to be taken during Stage 1 and Stage 2 drought conditions. In May 2015, the City adopted Urgency Ordinance 1996 which enacted mandatory emergency water conservation regulations in response to California Governor Brown's Executive Order B-29-15 which required statewide mandatory water use reductions. Copies of the ordinances are provided in **Part 4, Appendix B-4.**

The City has continuously implemented its Water Waste Prevention Ordinance over the last five years through a combination of education, outreach, and enforcement efforts. Staff have conducted 73 conservation related presentations to the general public and local schools, hosted 19 workshops, and issued over 5,219 continuous consumption notifications to proactively address potential water waste. In addition, 831 water waste violation notices have been issued, demonstrating the City's ongoing commitment to promoting water efficiency and ensuring compliance.

8.1.2. Metering

The City meters all customer connections, including separate metering for single-family residential, commercial, industrial, large landscape and institutional/governmental facilities. Furthermore, if there is new development within the City, each facility is individually metered. Service charges for the city are based on the customers' connection size. Further information regarding the City's service fees and conservation pricing is provided in **Section 8.1.3**.

The City has continuously metered all connections over the last five years.

8.1.3. Conservation Pricing

The City consumption Rates include components for Tiered Rates which includes four (4) consumption tiers and Elevation Rates. The revenue generated will fund the expenditures for groundwater production, purchased water, the storage and distribution of water, water conservation programing, and capital improvement program projects. The allowable usage in each tier takes into account the California Assembly Bill 1668 indoor water use goal, minimum usage by meter size, and the existing rate structure's Baseline Allocation Threshold Units.

The Elevation Rate component is broken up by four (4) zone classes to assign the costs fairly and equitably. The revenue generated will fund the energy expenditures that are required to pump water to the higher zone elevations and 50% of the operation and maintenance expenditures (salaries, benefits, customer service, tools, equipment, etc.) Water connection fees are added to the commodity rates to comprise the total water bill. The water connection fees are based on the size of the meter. Water bills are sent out bi-monthly.

The water rates have been developed to fund the cost of water and are related to the overall cost of water service. The tiered allocation rate encourages the customers to conserve water due to the utilities additional cost to produce an additional unit of water. This applies to all water use sectors (e.g., single family residential, multifamily residential, industrial, institutional, etc.). Therefore, there is an economic benefit for customers to conserve water. The City's Water Rates are currently adjustment annually by consumer price index at a not-to-exceed rate of five percent increase per year.

The City has continuously implemented conservation pricing for customer billing in accordance with its current rate schedule over the last five years.

8.1.4. Public Education and Outreach

The City developed a public information program in 2010 to educate the public to the benefits of water conservation. The program involves the dissemination of information through literature provided at City Hall and other City of Glendora facilities, as well as articles in the City of Glendora newsletter. The City periodically includes informational flyers with water bills to address water conservation and other important matters. The City periodically holds public seminars and workshops with other local agencies to promote water conservation. The City also provides water conservation information and updates on its website (https://www.cityofglendora.gov/Services/Water/Water-Conservation).

As part of a public outreach program for water conservation, City representatives visit schools to discuss water conservation with students. This discussion is usually included as part of an overall presentation on the City's water system and how it functions.

Over the last five years, the City has continuously implemented public education and outreach activities.



8.1.5. Programs to Assess and Manage Distribution System Real Losses

The City's system is comprised mainly of single and multi-family dwellings. The City's water losses range approximately from 10 to 19%, as discussed in **Section 2.1.3**. The City has water conservation literature that alerts customers to be on the lookout for water system leaks and to correct them promptly. The City is available to assist customers in answering questions regarding system leaks or higher than expected water usage. In addition, the City maintains two full-time staff to perform water use efficiency field surveys at the customers' property.

As a part of normal operation and maintenance of the water system, City staff does preventive maintenance. This includes regular checks on valves and meters, and pipeline maintenance. If leaks are encountered or suspected during routine inspection of the system, further evaluation is conducted. If leaks are found, they are repaired.

The City monitors the water system for loss by comparing water production to water sales. The City will continue to monitor the water system for water loss, and if a trend develops to indicate that further analyses are required, the City will provide the necessary funds to institute another leak detection program.

Over the last five years, the City has continuously implemented the activities described here each year.

8.1.6. Water Conservation Program Coordination and Staffing Support

Various City departments are involved in the water conservation program. These include maintenance and operations personnel, Public Works Director, Assistant Public Works Director, two Water Division Managers, and administrative staff who answer billing and usage questions and serve at the front counter at City Hall. The City's conservation staff consists of a Senior Management Analyst, a Management Analyst, and two Water Conservation Officers. The City's Water Conservation staff are responsible for all matters pertaining to the City's water conservation program including implementation of DMMs.

8.1.7. Other Demand Management Measures



8.1.7.1. Large Landscape Conservation Programs

The City routinely hosts seminars and workshops in the community to promote landscape conservation. The City continues to offer a rebate program for the purchase of landscape related items to both residential and commercial customers to promote water conservation. During FY 2020-2021 through FY 2023-2024, the City provided rebates for this program. During FY 2024-2025, the City participated in a regional rebate program, the SoCal WaterSmart Program.

8.1.7.2. Rebate Programs

Through TVMWD, the City participates in MWD's regional rebate program, the SoCal WaterSmart Program, which is available to the City's customers. There are residential rebates available for the purchase of high-efficiency clothes washing (HECW) machines, premium high-efficiency toilets (PHET), rotating sprinkler nozzles, weather-based irrigation controllers (Smart Controllers), rain barrels, rain cistern, soil moisture sensor system, and turf removal to promote water conservation. Some measures, including PHETs, Smart Controllers, and turf removal, are also available to commercial customers. The City's commercial customers are additionally offered plumbing, landscaping, HVAC, and medical and dental equipment rebates. The City provides information about this program to customers on its website. During FY 2020-2021 through FY 2023-2024, the City provided rebates for the program. During FY 2024-2025, the City participated in the regional rebate program.

8.1.7.3. Conservation Programs for Commercial, Industrial, and Institutional Accounts

The City regularly performs water use efficiency field surveys for commercial, industrial, and institutional customers. During FY 2020-2021 through FY 2023-2024, the City performed surveys for these customers. During FY 2023-2024, the City offered a plumbing direct install program. During FY 2024-2025, the City offered free surveys through a contracted vendor to perform indoor and outdoor water use efficiency

field surveys and water-efficient device upgrades. During FY 2024-25, the City offered a non-functional turf removal rebate program. The City will continue to coordinate with this sector of the community regarding water use and conservation through the public education process described above.

8.1.7.4. Smart Water Meter Program



The City initiated a program for meter upgrade for all customers. These meters wirelessly send usage information for billing and other important service notifications directly to the utility office. Customers can access their daily water usage information on their computer. Customer notifications on leaks, high usage, and other events are available as well. These activities will support the City's continual conservation efforts. The City provides information about this program to customers on its website available at this link.

This program has been continuously in effect for the last five years.

8.1.7.5. Free Water Conservation Programs

In FY 2023-24, the City partnered with SoCal Gas Company to co-fund energy and water efficiency upgrades for residential properties.

The City also has contracted a vendor that partners with MWD to offer Water Use Efficiency Surveys and the Irrigation Retrofit and Leak Repair Program. The surveys assess both outdoor and indoor water use for all customer classes, residential, commercial, industrial, and institutional properties. The Irrigation Retrofit and Leak Repair Program allows eligible participants to receive free irrigation upgrades.

The City provides information about this program to customers on its website available at this link.

The City implemented this program during FY 2024-2025.

8.1.8. Implementation to Achieve Water Use Targets

For decades, The City has valued and promoted conservation through implementation of a wide range of DMMs as described in this chapter. As a result, the City met its target to reduce per capita water consumption by 20% by 2020, as discussed in **Section 3**. Since 2020, the City has continued to implement these DMMs to promote long term water use efficiency.

Going forward, the City will continue to implement existing DMMs and explore additional programs to promote water use efficiency as a way of life.

9. Adoption, Submittal, and Implementation

This section describes the City's process for adopting, submitting, and implementing the 2025 RUWMP and WSCP.

9.1. Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2025 UWMPs are part of the 2025 RUWMP to all cities and counties and other stakeholders within the region that that 2025 RUWMP is being prepared. This notice was sent at least 60 days prior to the City's public hearing. The recipients are identified in **Part 1, Chapter 1** and include all cities and counties within the City's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

The City provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4, Appendix B-2**.

9.2. Public Hearing and Adoption

The City held a public hearing on **June 9, 2026** to hear public comments and consider adopting this 2025 RUWMP and the City's WSCP. As part of the public hearing, the City provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2025 RUWMP took place before the adoption of the Plan, which allowed the City the opportunity to modify the 2025 RUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

The City's adoption resolution for the 2025 RUWMP and the City's WSCP is included in **Part 4, Appendix B-3.**

9.3. Plan Submittal

The City will submit the 2025 RUWMP and the City's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2025 RUWMP submittal to DWR will be done electronically through DWR's "Water Use Efficiency (WUE) Data Portal" website. The complete set of DWR Submittal Tables for the City is included in **Part 4, Appendix B-5**.

9.4. Public Availability

Within 30 days of submitting its Plan to DWR, the City will make the 2025 RUWMP and the City's WSCP available for public review. Copies will be accessible during normal business hours at the City Clerk's Office in City Hall and posted on the City's website for public viewing.

9.5. Amending an Adopted UWMP or WSCP

If the adopted 2025 RUWMP or the City's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 2: Local Agency Urban Water Management Plans

FINAL

2025 RUWMP

JUNE 2026

Part 2 Chapter 3: City of La Verne 2025 Urban Water Management Plan



Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Appendices

Part 4, Appendix C of the 2025 RUMWP contains Agency Supporting Information.

Acronyms and Abbreviations

Acronym	Abbreviation
AB1668	Assembly Bill 1668
ADU	accessory dwelling units
AF	Acre-feet
AFY	acre-feet per year
AWWA	American Water Works Association
CII	commercial, industrial, and institutional
City	City of La Verne
CRA	Colorado River Aqueduct
CWC	California Water Code
CWOL	Making Conservation a California Way of Life Regulation
DCP	Drought Contingency Plan
DIM	Dedicated Irrigation Meters
DMMs	Demand Management Measures
DRA	Drought Risk Assessment
DWR	Department of Water Resources
FY	Fiscal year
GEI	GEI Consultants
GIS	geographic information systems
GPCD	gallons per capita per day
gpmd	gallons per mile of pipe per day
gpscd	gallons per service connection per day
GRIP	Groundwater Reliability Improvement Program
GRIP+	Groundwater Reliability Improvement Program (Plus)
GSWC	Golden State Water Company
HECW	high-efficiency clothes washing
kWh	kilowatt-hours
LACSD	Los Angeles County Sanitation Districts
MAF	million acre-feet
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
PHET	premium high-efficiency toilets
PWRP	Pomona Water Reclamation Plant
RHNA	Regional Housing Needs Assessment
RUWMP	Regional Urban Water Management Plan
SB606	Senate Bill 606
SCAG	Southern California Association of Governments
SJCWRP	San Jose Creek Water Reclamation Plant
SWP	State Water Project
TCE	Trichloroethene

TVMWD	Three Valleys Municipal Water District
UWMP	Urban Water Management Plan
UWUO	Urban Water Use Objectives
WRMP	Water Resources Master Plan

Individual UWMP

This chapter describes information specific to the City of La Verne (City), including its supplies, demands, and water use efficiency programs. The information and analysis provided in this chapter supplements the regional information presented in **Part 1 of the 2025 RUWMP** and is provided to fulfill the City's reporting requirements for 2025 under the UWMP Act.

The regional analyses described in **Part 1** (Regional Context) of the 2025 RUWMP were conducted using a consistent analytical framework, assumptions, and methodologies that are directly applicable to the City of La Verne. The City relies on **Part 1** of the RUWMP for the lay description, regional water supply availability, and the underlying technical methodology used to evaluate water supply reliability under normal, single dry-year, multiple dry-year, and five-year drought stress-test conditions.

The water supply reliability assessment and Drought Risk Assessment (DRA) applicable to the City's Urban Water Management Plan (UWMP) are presented in plain language in **Part 1** of the 2025 RUWMP, specifically within **Chapter 5**.

Building upon that regional foundation, the City-specific supply and demand comparisons are presented in the tables within this UWMP. Unless otherwise noted, the conclusions of the regional water supply reliability assessment and DRA are directly applicable to the City and satisfy the requirements of the Urban Water Management Planning Act and the 2025 UWMP Guidebook. A completed DWR UWMP Compliance Checklist for the City is provided in **Part 4, Appendix C-1**.

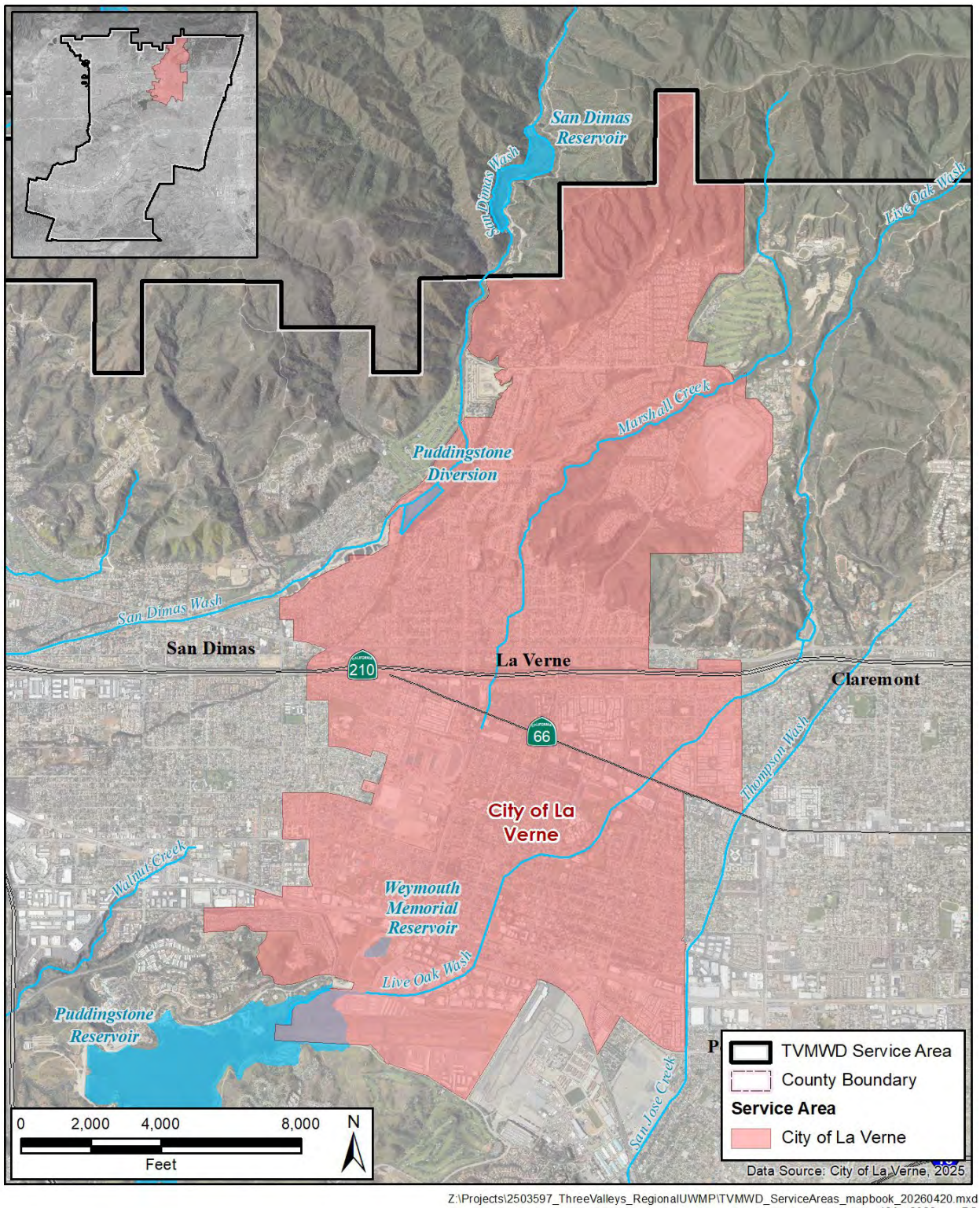
1. System Description

This section describes the City's water system, service area, population demographics, local climate, and land uses.

The City of La Verne was founded in 1887 and was officially incorporated in 1906. The City is located in the eastern section of Los Angeles County, approximately 32 miles east of metropolitan Los Angeles. It is bounded by the cities of San Dimas, Pomona, and Claremont, as well as portions of unincorporated Los Angeles County. The City of La Verne's service area covers approximately 8.5 square miles. The City's service area is shown in **Figure 1-1**.

Demand within the City's service area is met through groundwater and imported water. The City's groundwater supply is pumped from the Ganesha Basin, Live Oak Basin, and Pomona Basin (part of the Six Basins). To supplement these supplies, the City purchases treated imported water from the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD).

Figure 1-1. Service Area



1.1. Service Area

The system elevations range from approximately 1,000 feet above sea level, to an elevation of 1,700 feet above sea level.

The City is a retail public water supplier that meets the definition of an urban water supplier with 8,666 municipal water service connections in 2024. The regional climate, which includes the City service area, is described in **Part 1 Chapter 2** of the 2025 RUWMP.

1.1.1. Population, Demographics, and Socioeconomics

Estimates of population served by the City are based on the 2020 U.S. Census Bureau and the Southern California Association of Governments (SCAG) (Southern California Association of Governments, 2024). A geographic information systems (GIS) analysis of 2020 Census data was used to determine the City's 2020 service area population, which was 31,486. The 2020 population and the number of total connections served by the City in 2020 were used to derive a 2020 persons per connection factor of 3.6. This factor was then multiplied by the City's number of residential connections in 2025 to estimate the 2025 population served by the City. The number of connections in 2025 was lower than in 2020 so the resulting 2025 population shows a decline from 2020. To project the population served by the City from 2030 to 2050, average annual population growth rates from SCAG projections were applied to this 2025 estimate. A GIS analysis of SCAG projection data was used to determine the SCAG growth rate specific to the City's service area. SCAG projected an increase in population from 2019 to 2035 averaging 0.11% per year and from 2035 to 2050 averaging 0.03% per year. Estimated current and projected populations of the City's service area are included in **Table 1-1**.

Table 1-1. Current and Projected Population

Population Served	2025	2030	2035	2040	2045	2050
Total	30,807	30,971	31,135	31,189	31,243	31,298

The estimated 2025 and projected future number of households and employees within the service area were estimated using the same approach as population. SCAG projected an increase in households from 2019 to 2035 averaging 0.38% per year and from 2035 to 2050 averaging 0.12% per year. SCAG projected an increase in employment from 2019 to 2035 averaging 0.26% per year and from 2035 to 2050 averaging 0.04% per year. The estimated number of households and employees were determined by linear interpolation between SCAG projections for 2019, 2035, and 2050 as shown in **Table 1-2**.

Table 1-2. SCAG Household and Employment Projections for Water Service Area

Category	2025	2030	2035	2040	2045	2050
Households	12,016	12,242	12,467	12,545	12,624	12,702
Employees	16,208	16,415	16,622	16,554	16,685	16,717

According to U.S. Census Bureau QuickFacts from 2024, the median household income in the City is $103,761. The City's poverty rate is 8%. The City is 51% white alone, 11% Asian alone, 3% black alone, 22% two or more races, and 36% Hispanic or Latino. The average commute to work for workers at least 16 years of age is 32 minutes, which indicates that most jobs are local (United States Census Bureau,

2024). According to 2024 U.S. Census Bureau QuickFacts, the City's population is made up of 24% of seniors (65 years and over), 20% of persons under 18 years, and 4% of persons under 5 years. (United States Census Bureau, 2024). **Table 1-2** provides employment and household projections for the City's water service area based on SCAG GIS data intersected with the water service area.

1.1.2. Land Use

Per the Fiscal Year (FY) 2024-2025 Three Valleys Municipal Water District Assessed Service Area by Land Use, the City's land use distribution by parcel count is as follows:

- Single-Family Residential: 81%
- Multi-Family Residential and Condominiums: 11%
- Mobile Homes: <1%
- Commercial: 2%
- Churches: <1%
- Industrial: 2%
- Vacant Residential: 2%
- Vacant Non-Residential: 1%

2. Water Use

This section describes the current and projected water uses within the City's service area.

2.1. Water Use by Sector

2.1.1. Water Use Sectors Listed in Water Code

Water suppliers are required to identify water uses, to the extent that records are available, for at least each of the water use sectors identified in CWC 10631(d) to assist in the water demand projections. The City has no current recycled water demands.

The City serves the following water uses:

Single Family Residential

Single family residential customers are typically on a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.

Multi-Family Residential

Multi-family residential customers are typically multiple dwelling units within one building or several buildings within one complex.

Commercial

Commercial customers typically provide or distribute a product or service.

Institutional

Institutional water customers are typically public services, such as higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

Industrial

Industrial customers typically manufacture or process materials.

Agricultural

The City tracks the water use for agricultural irrigation.

Other

The City has accounts for other uses, which generally consist of schools and institutions.

Losses

Distribution system water losses are the water losses from the point of water entry to the distribution system to the delivery point to the customer's system. Water losses are discussed in **Section 2.1.3**.

The number of active connections is shown in **Table 2-1**.

Table 2-1. Calendar Year 2021-2025 Connections by Customer Class

Customer Class	2021	2022	2023	2024	2025
Residential – Single Family	7,534	7,575	7,578	7,446	7588
Residential – Multi-Family	360	361	361	361	360
Commercial/Institutional	868	878	878	857	885
Agricultural Irrigation	3	2	2	2	0
Total	**8,765**	**8,816**	**8,819**	**8,666**	**8,833**

2.1.2. Past and Current Water Use

The City serves potable water for a variety of uses, as summarized in **Table 2-2**. Over the past six years, the City served an average of 6,383 AFY of potable water. In 2025, 67% of the total potable water deliveries were to residential customers (51% to single-family accounts and 16% to multi-family accounts). **Table 2-2** shows the annual volume of potable water used by each customer class for 2025.

Table 2-2. DWR 4-1R Actual Demands for Water, 2025, AFY

Use Type	Potable or Non-Potable (*optional)*	2025 Volume
Single Family	Potable	3,458
Multi-Family	Potable	1,074
Commercial	Potable	575
Industrial	Potable	145
Institutional	Potable	1,205
Agricultural	Potable	18
Other	Potable	22
Distribution System Water Losses	Potable	201
	Total	**6,698**

2.1.3. Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. The City monitors its water loss and prepares an annual American Water Works Association (AWWA) Water Audit to estimate the volume of water loss. The City reports their AWWA Water Audit using a FY calendar. The City has submitted all required water loss audits to the State, as shown in **Table 2-3**. Copies of the City's recent AWWA audits are provided in **Part 4, Appendix C-6**.

Table 2-3. DWR 4-5R Month Water Loss Audit Reporting

Public Water System ID # Reported in DWR Table 2-1R	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910062	2020	Yes
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes
	2025	Yes

DWR Notes:

2020 AWWA: COLV 19_20 Validated Water Audit Dec 2020_Validated.xls
2021 AWWA: COLV 20_21 TAP Audit V5 (DM 11-17-2021).xlsx
2022 AWWA: COLV 21_22 Water Loss Audit Report V5.xls
2023 AWWA: Updated FWAS v6.0_release version 20210211_CityofLaVerne.xlsx
2024 AWWA: Final_City of La Verne - FY2024 - Water Audit.xlsx
2025 AWWA: City of La Verne - FY 2024-25_Water Audit_11.12.2025.xlsx

CWC Section 10608.34 required the State Resources Control Board (State Board) to develop water loss performance standards for urban retail water suppliers to minimize water waste through system leaks. Water loss performance standards were developed through a rulemaking that became effective in 2023. Under the regulations, each supplier will be required to comply, by 2028, with an individualized volumetric water loss standard based on real loss, using the economic model developed by the State Board and the supplier's own unique data. Real loss is the physical loss of water from water distribution systems, as opposed to apparent losses, which are revenue losses due to meter inaccuracies, billing errors or unauthorized consumption. A supplier's baseline water loss is calculated as the average water loss from at least 3 of the 4 water loss audits from 2017 – 2020. The real water loss performance standard is based on gallons per service connection per day (gpscd), or gallons per mile of pipe per day (gpmd), depending on how the supplier reports real loss. Post-2028 compliance with volumetric water loss standards will be assessed every three years based on the average of the supplier's real loss from the preceding three years, with an allowed variation of 5 gallons per connection per day above the supplier's water loss standard. Apparent loss standards are equal to the baseline apparent loss and compliance is evaluated at the same time as compliance with the Real Water Loss Performance Standard.

Although the compliance period has not yet started, CWC Section 10631 (d)(3)(C) requires water suppliers to provide data in the UWMP to show whether the supplier met its State Board water loss performance standard.

Over the last five years, the City water losses have ranged from 3% to 10% when calculated as the difference between billed consumption and total production. To project the water loss component of future demands, the City assumed future water losses will be approximately 6% of total customer water use. Calculated water losses are shown in **Table 2-4**.

Based on data released by the State on January 30, 2026, the City's baseline real water loss is 37.6 gpscd and the real water loss standard is 19.9 gpscd, and the apparent loss standard is the baseline of 10.1 gpscd. No reduction from the baseline is required to meet the water loss standard by 2028. As shown in

Table 2-5, based on the most recent water loss audit from 2024, the City has not yet met the real water loss performance standard, but is working toward that goal by 2028. **Section 8.1.5** discusses City's programs to assess and manage distribution system real loss.

Table 2-4. Calculated Water Loss

Water Loss	2021	2022	2023	2024	2025
Calculated Water Loss	790	674	364	289	201
% Water Loss	10%	9%	7%	5%	3%

Table 2-5. DWR 4-6R Progress Towards 2028 Water Loss Standard

Public System ID # Reported in Submittal Table 2-1R	Did the Water Board Calculate a Water Loss Standard for this Public System?	2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Standard	Number of Units	Volume of Total Real Water Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Real Water Loss per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Apparent Water Loss per Unit per Day
CA1910062	Yes	19.9	gpscd	8,618	331	30.3	10.1	gpscd	8,618	38	4.0

2.2. Projected Water Use

The "Making Conservation a California Way of Life" Regulation (CWOL Regulation) establishes unique water budget-based Urban Water Use Objectives (UWUO) for each urban retail water supplier in the State. The CWOL Regulation requires suppliers to calculate an annual UWUO consisting of these core components:

> UWUO = Residential Indoor Water Use Budget + Residential Outdoor Water Use Budget + Commercial, Industrial, and Institutional (CII) Dedicated Irrigation Meters (DIM) Outdoor Water Use Budget + Real Water Loss Budget

DWR and State Board have developed an annual reporting framework, tools, and guidance for calculating the UWUO and comparing it to the actual use for that year. The State Board's "Water Use Objective Exploration Tool" allows users to enter varying efficiency standards and baseline year(s) of input data to calculate and visualize a comparison of historic demand to the UWUO with selected standards. The State Board's "Annual UWUO and Water Use Report" tool pre-populates input data and standards for the given reporting year. To project demands for this UWMP, a demand tool that aligns with the framework, data, and calculations of the State Board's tools was used and updated to allow for forecasting future years' water demand considering future efficiency standards, supplier input data, and growth assumptions. Depending on the annual fluctuations of input data, a supplier's estimated UWUO reduction needed by 2040 can exceed 30% relative to the baseline usage. According to the CWOL Regulation, suppliers who must achieve over a 30% reduction in their 2040 UWUO compared to baseline usage are permitted to follow an alternative compliance method. This alternative method requires an annual decrease of 2% in gallons per capita per day (GPCD) compared to the baseline usage. If demands reduce by 2% per five-year planning period from 2025 (197 GPCD), this results in 178 GPCD in 2050. Population projections for 2050 (described in **Section 3.1**) applied to 178 GPCD results in 6,228 AFY.

Based on the demand analysis for this UWMP, the City anticipates a reduction of more than 30% may be needed to meet the UWUO. While the City intends to meet the UWUO, it was also considered that demands may continue in alignment with historic patterns initially and take more time than anticipated to reach direct alignment with the UWUO. Therefore, demands used for the purposes of supply reliability planning in this UWMP are assumed to equal average baseline demand for 2021-2025 in 2030, then trend to 178 GPCD (6,228 AFY) in 2050, as shown in **Figure 2-1**. The assumed future water loss of 6% was applied to the subtotal of demand for all types of connections to estimate future water losses. **Table 2-6** presents the projected demand by customer type through 2050 for this UWMP.

Figure 2-1. Historical and Projected Demand

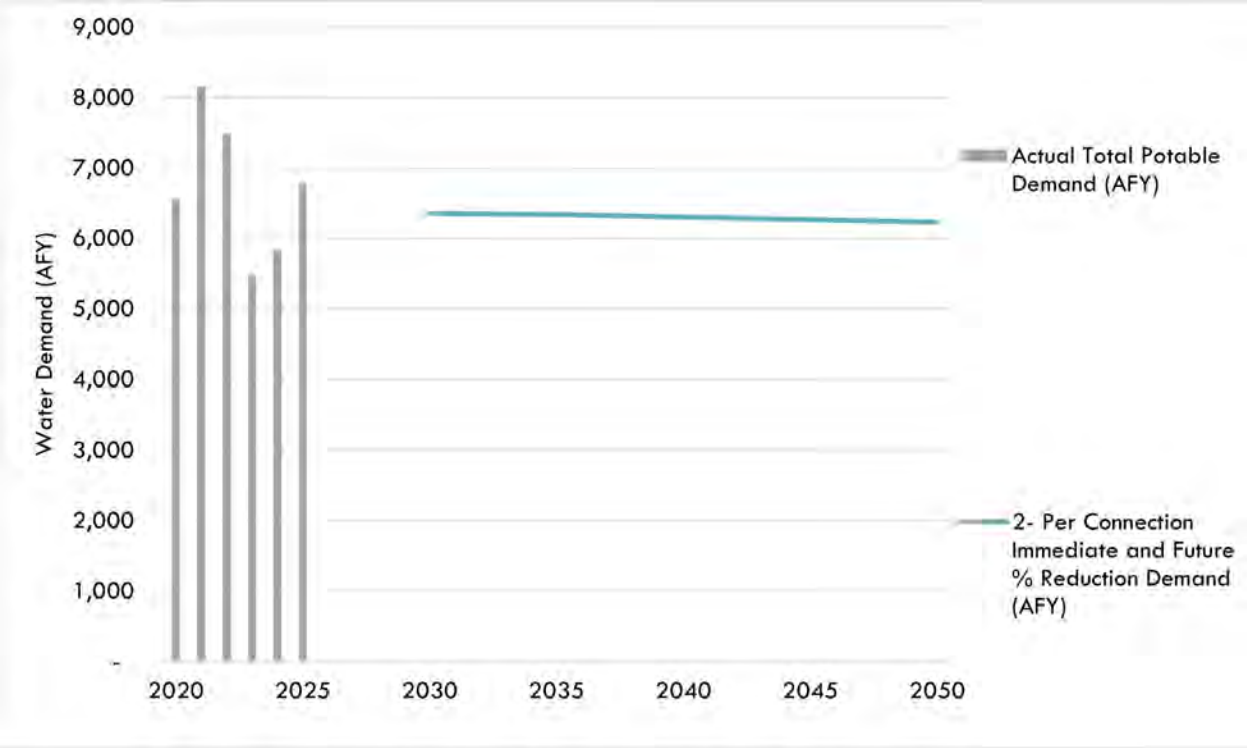


Table 2-6. DWR 4-2R Projected Demands for Water, AFY

Use Type	Additional Description	Level of Treatment When Delivered	Projected Water Use 2030	Projected Water Use 2035	Projected Water Use 2040	Projected Water Use 2045	Projected Water Use 2050
Single Family		Potable	3,189	3,182	3,163	3,144	3,126
Multi-Family		Potable	988	986	980	974	968
Commercial		Potable	531	530	526	523	520
Industrial		Potable	138	138	137	136	135
Institutional		Potable	1,098	1,096	1,090	1,083	1,077
Agricultural		Potable	17	17	17	17	17
Other		Potable	17	17	17	17	17
Distribution System Water Losses		Potable	374	374	371	369	367
		Total	**6,352**	**6,340**	**6,301**	**6,263**	**6,228**

Table 2-6 and **Table 2-7** satisfy the requirement to include anticipated water conservation savings when developing future demand projections demand estimates for the next 25 years since they account for water efficiency standards set by the State for the UWUO and an alternative compliance path to reduce by approximately 2% per five-year planning period from 2025. The City is complying with and planning for UWUO standards as described in **Sections 3 and 8**.

Senate Bill 1087 requires that water use projections in an UWMP include projected water use associated with single family and multi-family residential housing for lower income households, as identified in the housing elements of any city, county, or city and county within the supplier's service area. The Regional Housing Needs Assessment (RHNA) establishes housing needs for each jurisdiction over the applicable planning period. SCAG adopted the 6th Cycle RHNA Allocation Plan, which covers the planning period from October 2021 through October 2029 SCAG, March 2021). SCAG's population and household projections inform the RHNA Allocation Plan and are used in the determination and allocation of housing needs, including lower income housing, for individual jurisdictions. The growth projections in this UWMP are based on SCAG projections for the service area and therefore also incorporate the lower income housing projections. The projected demands in this UWMP represent water use from all future growth and are inclusive of water use for lower income households.

Table 2-7. DWR 4-3R Inclusion in Water Use Projections

Question	Yes or No
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included in Projections?	Yes

2.3. Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. A recent Climate Change Vulnerability Assessment utilizing data from DWR and 20 global climate models suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1, Chapter 2** of the 2025 RUWMP includes an assessment of the potential impacts of climate change.

3. SB X7-7 Compliance & Future Water Use Efficiency Requirements

This section describes compliance with the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7). The section demonstrates compliance with the 2020 SBX7-7 target and discusses future water use efficiency requirements.

3.1. Compliance and Future Water Use Efficiency Requirements

SBX7-7 was incorporated into the UWMP Act in 2009 and required that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20 percent by the year 2020.

SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, March 2021) specify methodologies for determining the baseline water demand, 2015 interim urban water use target, and the 2020 urban water use target for the City as described in the 2020 UWMP. This section also demonstrates that the City achieved its 2020 water use target.

Table 3-1 below establishes the City's 2020 actual and 2020 target GPCD. As shown, the City met its 2020 target. Most recently, in 2025, the water use was 197 GPCD, which is well below the 2020 target of 211 GPCD.

Table 3-1. SB X7-7 2020 Target Progress

2020 Target GPCD	2020 Actual GPCD	Did Supplier Achieve Target?
211	207	Yes

New water use efficiency standards from the "Making Conservation a California Way of life Regulation" (CWOL Regulation) supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the "2018 Water Conservation Legislation." Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation, each urban retail water supplier must comply with its UWUO. DWR and the State Board have developed a reporting framework for calculating the UWUO and compliance annually with efficiency standards becoming increasingly stringent through 2040.

The demand projections in this UWMP are based on the City meeting its estimated future UWUO, as described in **Section 2.2** in order to plan and implement necessary demand management measures (DMMs) (described in **Section 8**) to support meeting the UWUO. DMMs and UWUO compliance planning enhance resiliency for drought and other water shortage conditions as described in **Sections 5, 7, and 8**.

4. Water Supply

The City utilizes two primary sources for water supply: imported surface water purchased from the MWD through TVMWD and groundwater pumped from the Six Basins. More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2025 RUWMP.

4.1. Purchased or Imported Water

The City purchases treated imported water from MWD through TVMWD. MWD imports water from the Colorado River through the Colorado River Aqueduct (CRA), owned and operated by MWD, and the State Water Project (SWP), which utilizes the CRA for transmission to Southern California. Water delivered to TVMWD's member agencies can be receive treated imported water from MWD's Weymouth Treatment Plant located in the City of La Verne or from TVMWD's Miramar Water Treatment Plant located in the City of Claremont.

The City's treated imported water supplies from MWD, through TVMWD, may be impacted during a multi-year drought or other conditions which limits MWD from delivering sufficient water supplies to all its member agencies, and consequently to the City. A description of this supply and its reliability is provided in **Part 1 Chapter 3** and **Chapter 5** of the RUWMP.

4.2. Groundwater

The City produces groundwater from Six Basins. Six Basins has been adjudicated and is managed for long-term sustainability, as discussed further in **Part 1 Chapter 3** of the 2025 RUWMP.

4.2.1. Six Basins

Six Basins is a group of six interconnected groundwater basins that underlie areas of the Cities of Claremont, La Verne, Pomona, and Upland, and surrounding unincorporated areas of Los Angeles and San Bernardino Counties.

A court-appointed Watermaster is responsible for the administration of the Six Basins Judgment. Pursuant to the Judgment, the safe yield of the Six Basins is 19,300 AFY, which is defined as the amount of water that can be produced from the parties on an annual basis to ensure long-term, sustainable groundwater production. The production, replenishment, and recovery of the Live Oak and Ganesha Basins (collectively referred to as Two Basins) are reserved solely for the City of La Verne and are not subject to any groundwater production limitations, provided that production by the City of La Verne does not substantially injure the rights of any other Six Basin parties. However, the Canyon, Upper Claremont Heights, Lower Claremont Heights, and Pomona Basins (collectively referred to as Four Basins) are subject to individual Operating Safe Yields (OSY) determined annually by the Six Basins Watermaster.

The City has an adjudicated right in Four Basins to 7.601 percent of the OSY. The City specifically extracts groundwater from the Live Oak Basin, the Ganesha Basin, and the Pomona Basin.

Table 4-1 summarizes the City's actual groundwater production over the past five years. Pumping volumes fluctuate annually based on total system demand, the availability of surface water, and local hydrological conditions.

Table 4-1. DWR 6-1R Groundwater Pumped Last Five Years (AF)

Groundwater Type	Location or Basin Name	2021	2022	2023	2024	2025
Alluvial Basin	Ganesha Basin	179	106	77	168	554
Alluvial Basin	Live Oak Basin	559	564	381	812	964
Alluvial Basin	Pomona Basin	1,154	1,221	861	763	963
	Total	**1,892**	**1,891**	**1,319**	**1,743**	**2,481**

4.3. Surface Water

The City does not use surface water sources to meet its water demands.

4.4. Stormwater

The City does not directly use stormwater to meet its water demands.

4.5. Wastewater and Recycled Water

Wastewater is only collected within the service area, not treated or discharged within the City's service area. It is treated by the Sanitation Districts of Los Angeles County (LACSD). The wastewater is collected within the City's local sewer collection system which ties into LACSD's regional trunk sewers crossing through the City. The two offsite wastewater treatment plants used by the City is the Pomona Water Reclamation Plant (PWRP) and the San Jose Creek Water Reclamation Plant (SJCWRP). The percentage breakdown between these two plants in treating the City's wastewater is unknown; the City will work with LACSD to better characterize this breakdown as part of ongoing facility planning. To align with current conservation realities and CWOL framework, wastewater generation is estimated utilizing the State's 2025 indoor residential water use standard of 47 GPCD (as indoor water use serves as the direct proxy for wastewater generation). Based on the City's 2025 population of 30,807, the estimated amount of wastewater collected by the City is approximately 1.45 MGD (about 1,622 AFY). **Table 4-2** shows existing wastewater collection and treatment at LACSD.

The City of La Verne does not have access to recycled water supplies.

4.5.1. Potential, Current, and Projected Recycled Water Uses

The City of La Verne currently does not have access to recycled water supplies due to the lack of infrastructure to convey recycled water to the City. There is currently no forecast to develop recycled water distribution infrastructure to provide recycled water as a supply source for the City. In order to

achieve this, the City would have to invest in developing recycled water distribution infrastructure to transport recycled water from SJCWRP, which is more than 15 miles away from the City of La Verne. Currently, developing a recycled water delivery system is not economically feasible for the City due to the extensive capital infrastructure required to transport water over 15 miles from the SJCWRP.

Table 4-2. DWR 6-2R Wastewater Collected within Service Area in 2025 (AF)

Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Volume of Wastewater Collected from UWMP Service Area 2025**	**Name of Wastewater Treatment Plant (WWTP) and Place ID Number**	**Is WWTP Located Within UWMP Area?**
LACSD	Estimated	1,622	SJCWRP (Place ID 260156), PWRP (Place ID: 250700)	No
	Total	**1,622**		

4.6. Water Exchanges and Transfers

The City does not have any current or planned water exchange opportunities.

The City also does not have any current or planned water transfer opportunities.

4.7. Future Water Projects

According to the City of La Verne's 2020 Water Master Plan, four capital projects are identified to support future water supply reliability. These include conducting an ADU study to evaluate how additional accessory dwelling units may affect water and sewer system capacity; constructing a new well in the Pomona Basin to replace the aging Cartwright Well and restore about 1,000 gpm of production; building a 1,000 gpm nitrate-reduction treatment plant at the White Avenue site to improve groundwater quality and reduce dependence on imported water; and developing a new well in the Live Oak Basin to offset declining capacity from the La Verne Heights No. 1 Well and achieve a combined 500–1,000 gpm production with the existing Beech Street Well.

Additionally, as part of the TVMWD Water Resources Master Plan (WRMP) and Drought Contingency Plan (DCP) with the member agencies, the City is currently pursuing several projects to increase water supply reliability. Future projects include:

- Connections to Weymouth Water Treatment Plant to improve system interties.
- Well Treatment 6th and White, Lincoln and Mills – Ion-exchange Plant to implement groundwater treatment. This project is expected to increase overall supply by approximately 3,500 AF.
- La Verne Heights Well #1 Replacement – Ion-exchange for enhancing well efficiency.

Four regional water supply projects were also identified in the WRMP and DCP effort through collaboration with TVMWD, member agencies, and regional stakeholders. These regional projects, described in **Part 1, Chapter 3**, are intended to enhance overall supply reliability for the region.

- Project 1: External Partnership with CVWC – Main Basin
- Project 2: TVMWD Groundwater Reliability Improvement Program (GRIP)
- Project 3: TVMWD Storing Water in Main San Gabriel Basin (GRIP+)
- Project 4: TVMWD–Pomona Chino Basin Conjunctive Use Exchange

As development progresses and increased demands are placed on the system, the City will determine which projects to implement.

4.8. Summary of Existing and Planned Sources of Water

The City's water supply is comprised of treated imported water and groundwater. The volume of water utilized from each source in 2025 is summarized in **Table 4-3** and projected supply is summarized in **Table 4-4**.

Table 4-3. DWR 6-8R Actual Water Supplies in 2025 (AF)

Water Supply	Additional Detail on Water Supply	2025 Actual Volume	2025 Potable or Non-Potable *(optional)*	2025 Total Entitlement *(optional)*
Groundwater (not desalinated)	Six Basins	2,396	Potable	
Purchased or Imported Water	Metropolitan Water District – TVMWD	4,302	Potable	
	Total	**6,698**		-

Supply Projection Methodology

To project future water supplies accurately and conservatively, the City, in coordination with TVMWD, evaluated supply projection methodologies. Rather than projecting supplies based on maximum legal entitlements or absolute physical extraction capacity, the City opted to utilize a "Real Water" (Utilization-Based) approach. This approach grounds future projections in empirical operational reality. The methodology utilized a baseline representing the City's average local supply utilization over the most recent five-year period (2021–2025), which was 6,722 acre-feet per year (AFY). This baseline smoothed out historically dry years (e.g., 2021) and historically wet years (e.g., 2023).

As described in **Part 1, Section 5.1.2**, to calculate the projected supplies shown in **Table 4-4**, the following steps were applied:

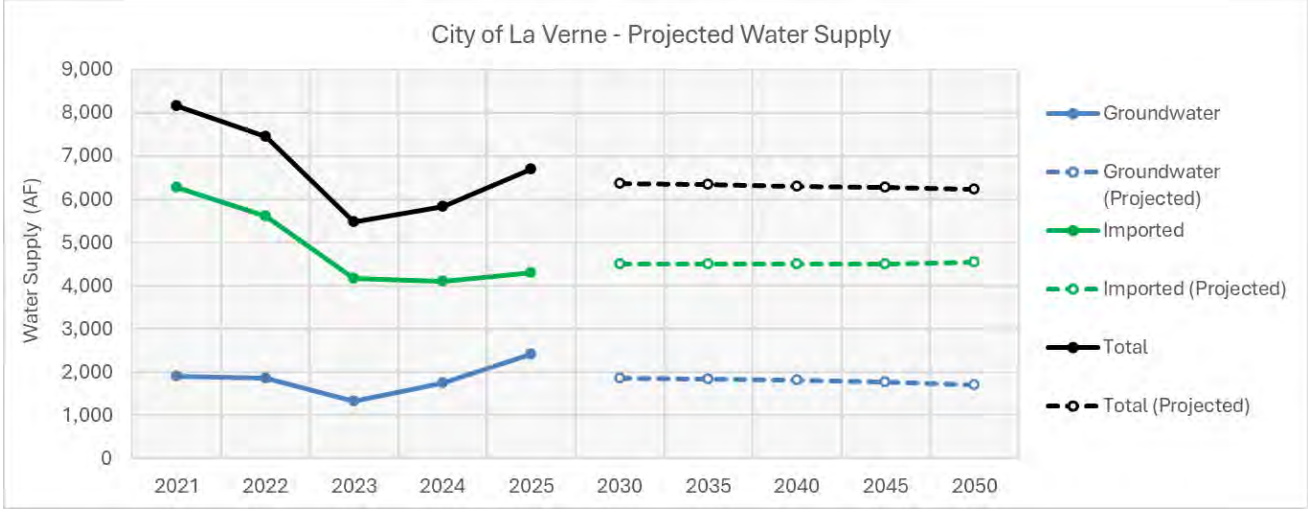
1. **Climate Change Adjustments:** Specific climate change vulnerability factors, derived from TVMWD's 2024 Climate Vulnerability Analysis, were applied to the 2021-2025 baseline local agency supplies (Chino Basin groundwater and Six Basins groundwater) to forecast anticipated local yields through 2050.
2. **Imported Water Reliance:** The projected local supplies were then compared against the City's projected demand. Any projected unmet demand is assumed to be fulfilled by imported water purchases from TVMWD.

As shown in **Table 4-4** and **Figure 4-1**, the City's reliance on Six Basins is projected to decrease slightly over time under a climate change planning scenario that models potential impacts to local hydrology. Under this specific scenario, imported water purchases from TVMWD are projected to increase modestly to balance the City's overall supply portfolio and meet customer demands. It is important to note that these projections are intended for long-term vulnerability planning purposes only; they do not incorporate future adaptation or mitigation strategies currently being developed or implemented at the regional level. Future actions, such as those identified in the DCP, are specifically designed to reduce or offset these potential climate-related impacts to local groundwater supplies.

Table 4-4. DWR 6-9R Projected Water Supplies (AF)

Water Supply	Additional Detail on Water Supply	2030	2035	2040	2045	2050
Groundwater (not desalinated)	Six Basins	1,849	1,834	1,803	1,758	1,700
Purchased or Imported Water	Metropolitan Water District – TVMWD	4,503	4,506	4,498	4,505	4,528
	Total	**6,352**	**6,340**	**6,301**	**6,263**	**6,228**

Figure 4-1. City of La Verne Projected Supply and Demand Comparison (AF)



4.9. Energy Intensity of Water Supplies

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

Energy consumption data specific to water supply and treatment facilities were not available for 2025 at the time of UWMP preparation. Consistent with the methodology documented in the City's 2020 UWMP, energy use was estimated using an average energy intensity of 94.4 kilowatt-hours per acre-foot (kWh/AF) derived from a review of electric utility billing records. Applied to total water volumes delivered in 2025 (6,698 AF), total estimated annual energy consumption associated with water facilities is approximately 632,000 kWh.

5. Water Service Reliability Assessment

This section considers the City's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from the City's current source of supply through 2050.

5.1. Constraints on Water Sources

While the City maintains a highly reliable water portfolio, its supply sources are subject to various environmental, regulatory, and infrastructural constraints. A comprehensive analysis of regional water supply constraints is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the RUWMP.

For the City of La Verne specifically, the primary constraints on water sources include:

- **SWP-Dependent Infrastructure:** Due to pipeline elevations and regional network hydraulics, the City of La Verne is situated within an "SWP-Dependent Area." This means the City is served by the Rialto Pipeline and TVMWD's Miramar Water Treatment Plant, which cannot physically receive treated Colorado River water from the CRA and rely entirely on SWP flows. As detailed in **Part 1, Chapter 3**, MWD typically buffers SWP allocation cuts using regional storage and its Water Supply Allocation Plan (WSAP). However, during severe multi-year droughts, physical limitations in delivering stored water to the Rialto Pipeline can trigger localized shortages and emergency mandates (such as the 2022 SWP-Dependent Area Emergency Conservation Program). Consequently, during severe multi-year droughts when SWP allocations are drastically reduced by the State, the City must rely heavily on its local groundwater reserves from the Six Basins to offset imported water constraints.
- **Groundwater Quality:** Contaminants such as nitrate, TCE, and perchlorate in the Six Basins can force the City to temporarily remove active extraction wells from service. To mitigate this constraint, the City is actively investing in wellhead treatment and replacement projects (e.g., the White Avenue nitrate-reduction treatment plant and the Cartwright Well replacement) as detailed in **Section 4.7**.
- **Climate Change Impacts on Surface Water:** As identified in **Part 1, Section 2.5**, local hydrology is highly susceptible to climate-driven volatility, including shorter rainy seasons and prolonged dry periods. These conditions can impact the natural replenishment of the Six Basins and the long-term availability of the City's imported supplies.

5.2. Year Type Characterization

In general, groundwater is less vulnerable to seasonal and climatic changes than surface water (i.e. local and imported) supplies. The Six Basins Watermaster monitors groundwater levels and implements supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1 Chapter 3**.

Because the City's baseline years are a mix of different hydrologic conditions, it is important to note how the City's supply strategy adapts to dry years. The City's primary source of groundwater supply, the Six Basins, provides unique operational flexibility. While the City's production from the Four Basins area is subject to a variable OSY that may decline during dry periods, the City also holds exclusive rights to the Two Basins area, which is not subject to production limitations. Furthermore, under the basin's adjudication framework, the City can legally and physically continue to produce the water it needs from the Four Basins to meet elevated dry-year demands by paying Replacement Water assessments for any production that exceeds its rights. As a result, the City's operational supply strategy is not significantly different in dry years compared to normal years. The changes in the City's projected baseline supply over time are primarily driven by long-term climate change factors (as detailed in **Section 4.8**) and planned infrastructure projects.

Per UWMP requirements, the City has evaluated reliability for an average year, single dry year, and a five consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** The single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** The driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

To characterize these year types, the City evaluated historical supply and demand data. For the purposes of this 2025 UWMP, the City established a "Normal Year" baseline using the average annual supply and demand from 2021 through 2025.

Because water demand in the City typically increases during dry years due to elevated outdoor irrigation needs, the "Single Dry Year" and "Five-Year Drought" scenarios are modeled using historical years where production peaked to meet elevated drought demands. **Table 5-1** summarizes the base years utilized for this analysis and the corresponding volume of water available/utilized as a percentage of the average year.

Table 5-1. DWR 7-1R Basis of Water Year Data

Year Type	Base Year (FY)	Volume Available (AF)	% of Average Supply
Average Year	2021-2025	6,722	100%
Single-Dry Year	2021	8,170	122%
Consecutive Dry Years 1st Year	2018	7,532	112%
Consecutive Dry Years 2nd Year	2019	6,981	104%
Consecutive Dry Years 3rd Year	2020	7,251	108%
Consecutive Dry Years 4th Year	2021	8,170	122%
Consecutive Dry Years 5th Year	2022	7,440	111%

5.3. Water Service Reliability

The results of the reliability assessment are summarized below.

As established in **Section 4.8 and Part 1, Section 5.1.2**, the City utilized the "Real Water" (Utilization-Based) methodology to project its future supplies. Under this operational approach, the City projects its local groundwater supplies based on historical averages adjusted for climate change. Any remaining unmet demand is fulfilled by purchasing imported water from TVMWD.

The City's projected "Normal Year" water demands over the next 25 years were developed using a demand-per-connection approach as discussed in **Section 4.8** and **Section 5.2**. This approach utilizes a baseline period of 2025 to approximate normal demand patterns, projects future connections based on SCAG growth rates and incorporates anticipated reductions due to passive conservation and compliance with the new "Making Conservation a California Way of Life" (CWOL) regulatory framework.

To estimate projected demands during drought conditions, the City utilized a historical ratio methodology. Because water demand in Southern California typically increases during hot, dry periods due to elevated outdoor irrigation needs, the City analyzed the ratio of total water utilized during historical dry periods compared to a historical average year.

Based on the City's operational data, the historical average year baseline was established using the five-year period of FY 2021–2025 (averaging 6,722 AF).

- **Single Dry Year Scaling:** The ratio of water utilized during the historical single dry year of FY 2021 (8,170 AF) to the historical average (6,722 AF) yielded a scaling factor of 122%. This **122%** factor was applied to the projected normal year demands to estimate the City's projected water demands during future single dry years.
- **Five-Year Drought Scaling:** To estimate demands during a five-consecutive-year drought, the City utilized the historical drought sequence from FY 2018 through FY 2022. The ratio of water utilized in each of these years (7,532 AF, 6,981 AF, 7,251 AF, 8,170 AF, and 7,440 AF, respectively) compared to the historical average yielded scaling factors of **112%, 104%, 108%, 122%, and 111%** for years one through five of the drought sequence, respectively. These factors were applied to the projected normal year demands to forecast future multi-year drought demands.

Because TVMWD and MWD have demonstrated 100% supply reliability to meet wholesale demands through 2050 (supported by MWD's 2025 UWMP supply and reliability analysis (MWD, 2026)), the City's total supply is projected to perfectly meet its total projected demand across all hydrologic scenarios. Consequently, the difference between supply and demand in the tables below is zero, reflecting a fully reliable water portfolio through the 2050 planning horizon.

Table 5-2, **Table 5-3**, and **Table 5-4** summarize the City's projected water supplies and demands over the next 25 years in five-year increments. These tables demonstrate the City can reliably meet elevated water demands during normal years, single dry years, and five-consecutive-year drought periods over the next 25 years.

Table 5-2. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	6,352	6,340	6,301	6,263	6,228
Demand totals	6,352	6,340	6,301	6,263	6,228
Difference	0	0	0	0	0

Table 5-3. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	7,720	7,705	7,658	7,612	7,569
Demand totals	7,720	7,705	7,658	7,612	7,569
Difference	0	0	0	0	0

Table 5-4. DWR 7-4R Multiple Dry Years Supply and Demand Comparison

Year	Totals	2030	2035	2040	2045	2050
First Year	Supply Totals	7,117	7,104	7,060	7,018	6,978
	Demand Totals	7,117	7,104	7,060	7,018	6,978
	Difference	0	0	0	0	0
Second Year	Supply Totals	6,597	6,584	6,544	6,504	6,468
	Demand Totals	6,597	6,584	6,544	6,504	6,468
	Difference	0	0	0	0	0
Third Year	Supply Totals	6,852	6,839	6,797	6,756	6,718
	Demand Totals	6,852	6,839	6,797	6,756	6,718
	Difference	0	0	0	0	0
Fourth Year	Supply Totals	7,720	7,705	7,658	7,612	7,569
	Demand Totals	7,720	7,705	7,658	7,612	7,569
	Difference	0	0	0	0	0
Fifth Year	Supply Totals	7,030	7,017	6,974	6,932	6,893
	Demand Totals	7,030	7,017	6,974	6,932	6,893
	Difference	0	0	0	0	0

6. Drought Risk Assessment

The Drought Risk Assessment (DRA) is an analysis required for the 2025 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2026. While Section 5 evaluated long-term reliability through 2050, the DRA serves as an immediate stress test, focusing specifically on the five-year period from 2026 through 2030. The purpose of this assessment is to determine if the City anticipates any supply shortages in the immediate future that would necessitate triggering mandatory demand reduction measures outlined in the Water Shortage Contingency Plan.

6.1. Data, Methods, and Basis for Water Shortage Conditions

To conduct the DRA, the City utilized the same "Real Water" supply methodology and historical drought scaling factors detailed in **Section 4.8** and **Section 5**. The assessment simulates a severe, five-consecutive-year drought mirroring the hydrology of Fiscal Years 2018 through 2022.

Because hot, dry weather drives increases in outdoor irrigation, the City's unconstrained demands are projected to scale up significantly during this period (up to 122% of average baseline demand, as established in **Section 5.3**). The DRA tests whether the City's local groundwater and imported water portfolios can sustain these elevated demands over the next five years without natural replenishment.

6.2. DRA Water Source Reliability

The City's near-term reliability is highly secure due to the active management of the Six Basins and the unprecedented storage reserves held by its wholesale providers.

Entering the 2026–2030 DRA period, MWD holds nearly 4 million acre-feet (MAF) of water in regional storage, which is a near-record high. MWD's 2025 UWMP DRA modeling confirms that even if the SWP and CRA experience five consecutive years of severe constraint, MWD has sufficient stored reserves to meet all wholesale member agency demands without shortage allocations through 2030. Consequently, TVMWD can reliably supply the City with imported water to cover any deficits caused by constrained local groundwater production.

6.3. Total Water Supply and Use Comparison

Table 6-1 details the DRA for the 2026–2030 period. As demonstrated in the table, the City's projected supplies are sufficient to fully and consistently meet the elevated, unconstrained demands for every year of the five-year drought sequence.

Because the City anticipates having sufficient supply (a difference of zero) across all five years of the near-term drought scenario, the City does not currently project a need to implement mandatory, extraordinary conservation measures or trigger advanced stages of its WSCP due to supply shortages. However, the City remains committed to ongoing water conservation and will continue to enforce standard water waste prohibitions to preserve regional storage.

Table 6-1. DWR 7-5 Five-Year Drought Risk Assessment (AF)

Category	2026	2027	2028	2029	2030
Total Water Use (Demand)	7,117	6,597	6,852	7,720	7,030
Total Supplies	7,117	6,597	6,852	7,720	7,030
Surplus/Shortfall without WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP – Supply Augmentation Benefit	0	0	0	0	0
WSCP – Use Reduction Savings Benefit	0	0	0	0	0
Revised Surplus/(Shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP Action	**0%**	**0%**	**0%**	**0%**	**0%**

7. Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) is a strategic plan developed by the City to proactively manage and respond to both anticipated and unforeseen water shortages. A water shortage is defined as a condition in which available water supplies are inadequate to meet expected customer demand at a specific point in time. Such shortages may result from various factors, including but not limited to, water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demand.

The City's WSCP is a detailed approach which presents how the City intends to act, or respond, in the case of an actual water shortage. It outlines a process for conducting annual water supply and demand assessments and establishes clearly defined stages and response measures to respond to actual conditions. This level of preparedness enhances transparency, ensures accountability, and supports the City's ability to maintain reliable water service during periods of supply disruption.

The WSCP was prepared in conjunction with the 2025 RUWMP and is presented as a standalone document that may be updated as necessary. No substantive changes have been incorporated into the 2025 WSCP compared to the 2020 version. Minor editorial updates were made for clarity and consistency; however, the content, procedures, and response actions remain relatively unchanged.

The City's WSCP is included in **Part 4, Appendix C-7**.

8. Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that La Verne has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. The City met the 2025 Water Use Target through the implementation of these DMMs. The City expects to continue to implement current DMMs to encourage conservation and achieve its water use targets.

8.1. Existing Demand Management Measures

8.1.1. Water Waste Prevention Ordinances

In May 2017, the City passed Ordinance No. 1076 – Water Conservation Update (**Part 4, Appendix C-4**) creating rules, regulations and setting penalties that encourage efficient water use practices.

The City has continuously implemented its Water Waste Prevention Ordinance over the last five years.

8.1.2. Metering

The City is fully metered for all customer sectors. There are no unmetered services within the customer base.

The City has continuously metered all connections over the last five years.

8.1.3. Conservation Pricing

The City of La Verne implements an increasing block pricing structure for all water connections. The price per unit is constant; therefore, the greater the consumption, the greater the cost for the customer. Sewer fees are charged at a flat rate for residential customers. Commercial/Industrial customers are charged a rate that is based on a percentage of water consumption.

The City has continuously implemented conservation pricing for customer billing in accordance with its current rate schedule over the last five years.

8.1.4. Public Education and Outreach

The City works in coordination with MWD, TVMWD, Southern California Edison, and Southern California Gas Company to develop and disseminate public outreach information. There are several informational outreach strategies implemented by the City. Information on efficient water use is posted on the City's website, broadcast on the local cable access channel, published in newsletters, and distributed directly in customer water bills. The City website provides an archive on water conservation tips in the conservation corner newsletters. Coordination efforts with MWD for water conservation can also be found on the City website (available at this link).

Over the last five years, the City has continuously implemented public education and outreach activities.

8.1.5. Programs to Assess and Manage Distribution System Real Loss

Each year there is a review of water purchases and production versus the sale of water to measure total water losses. The City performs a comprehensive system-wide water audit every year.

There are programs in place for the inspection, repair and replacement of aging distribution and supply infrastructure as well as the inspection, calibration and replacement of service meters including the installation of Automatic Meter Reading devices. The City continually monitors meter telemetry for anomalies, which may be caused by a sudden change in water use behavior, unauthorized use, an inaccurate meter, or a leak. Any identified leaks are immediately repaired. The City also completes random meter testing throughout the system.

The City will be hiring a contractor in the coming year to perform leak detection and water loss audits. Results have been very effective in reducing water losses.

Over the last five years, the City has continuously implemented the activities described here each year.

8.1.6. Water Conservation Program Coordination and Staffing Support

While the City no longer maintains an active equivalent conservation coordinator position, the City continues to coordinate, support, and implement water conservation efforts through existing staff and established programs. Water conservation activities are integrated across multiple departments and are carried out in coordination with regional partners, including TVMWD, MWD, and other agencies, as applicable.

As described in the preceding sections, the City maintains a comprehensive set of DMMs, including water waste prevention ordinances, conservation-oriented rate structures, public education and outreach, and programs. Over the last five years, the City has continuously supported and implemented water conservation programming.

8.1.7. Other Demand Management Measures

8.1.7.1. Rebate Programs

Through TVMWD, the City participates in MWD's regional SoCal WaterSmart rebate program, which is available to the City's residential and commercial customers. There are residential rebates available for the purchase of high-efficiency clothes washing (HECW) machines, premium high-efficiency toilets (PHET), weather-based irrigation controllers (Smart Controllers), rain barrels, rain cisterns, and turf removal to promote water conservation. Some measures, including PHETs, Smart Controllers, and turf removal, are also available to commercial customers. The City's commercial customers are additionally offered plumbing, landscaping, HVAC, and medical and dental equipment rebates. The City provides information about this program to customers on its website.

This program has been continuously in effect for the last five years.

8.1.7.2. Landscape Training

The City of La Verne offers free waterwise gardening videos to learn how to use rainwater as a resource and manage irrigation in backyards. The recording of the classes is available on the City's website.

9. Adoption, Submittal, and Implementation

This section describes the City's process for adopting, submitting, and implementing the 2025 RUWMP and WSCP.

9.1. Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2025 UWMPs are part of the 2025 RUWMP to all cities and counties and other stakeholders within the region that that 2025 RUWMP is being prepared. This notice was sent at least 60 days prior to the City's public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within the City's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

The City provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4, Appendix C-2**.

9.2. Public Hearing and Adoption

The City held a public hearing on **May 18, 2026** to hear public comments and consider adopting this 2025 RUWMP and the City's WSCP. As part of the public hearing, the City provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2025 RUWMP took place before the adoption of the Plan, which allowed the City the opportunity to modify the 2025 RUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

The City's adoption resolution for the 2025 RUWMP and the City's WSCP is included in **Part 4, Appendix C-3.**

9.3. Plan Submittal

The City will submit the 2025 RUWMP and the City's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2025 RUWMP submittal to DWR will be done electronically through DWR's "Water Use Efficiency (WUE) Data Portal" website. The complete set of DWR Submittal Tables for the City is included in **Part 4, Appendix C-5**.

9.4. Public Availability

Within 30 days of submitting its Plan to DWR, the City will make the 2025 RUWMP and the City's WSCP available for public review. Copies will be accessible during normal business hours at the City's Office and posted on the City's website for public viewing.

9.5. Amending an Adopted UWMP or WSCP

If the adopted 2025 RUWMP or the City's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 2: Local Agency Urban Water Management Plans

FINAL

2025 RUWMP

JUNE 2026

Part 2 Chapter 4: City of Pomona 2025 Urban Water Management Plan



CITY OF POMONA
Water Resources Department

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Appendices

Part 4, Appendix D of the 2025 RUMWP contains Agency Supporting Information.

Acronyms and Abbreviations

Acronym	Description
AB1668	Assembly Bill 1668
AF	Acre-feet
AFY	acre-feet per year
AWWA	American Water Works Association
City	City of Pomona
CPUC	California Public Utilities Commission
CRA	Colorado River Aqueduct
CWC	California Water Code
CWOL	“Making Conservation a California Way of Life” Regulation
DCP	Drought Contingency Plan
DIM	Dedicated Irrigation Meters
DMMs	Demand Management Measures
DRA	Drought Risk Assessment
DWR	Department of Water Resources
DYYP	Dry-Year Yield Program
GEI	GEI Consultants
GIS	geographic information systems
GPCD	gallons per capita per day
GRIP	Groundwater Reliability Improvement Program
GRIP+	Groundwater Reliability Improvement Program (Plus)
HECW	high-efficiency clothes washing
HVAC	Heating, Ventilation, and Air Conditioning
IEUA	Inland Empire Utilities Agency
LACSD	Los Angeles County Sanitation Districts
MAF	million acre-feet
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
PHET	premium high-efficiency toilets
PWRP	Pomona Water Reclamation Plant
RHNA	Regional Housing Needs Assessment
RUWMP	Regional Urban Water Management Plan
SB606	Senate Bill 606
SBX7-7	Senate Bill 7 of Special Extended Session 7
SCAG	Southern California Association of Governments
SJCWRP	San Jose Creek Water Reclamation Plant
State Board	State Resources Control Board
SWP	State Water Project
TCE	Trichloroethene
TVMWD	Three Valleys Municipal Water District

USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
UWUO	Urban Water Use Objectives
WEWAC	Water Education Water Awareness Committee
WRMP	Water Resources Master Plan
WSCP	Water Shortage Contingency Plan
WWTP	Wastewater Treatment Plant

Individual UWMP

This chapter describes information specific to the City of Pomona (City), including its supplies, demands, and water use efficiency programs. The information and analysis provided in this chapter supplements the regional information presented in **Part 1 of the 2025 Regional Urban Water Management Plan (RUWMP)** and is provided to fulfill the City of Pomona's reporting requirements for 2025 under the UWMP Act.

The regional analyses described in **Part 1** (Regional Context) of the 2025 RUWMP were conducted using a consistent analytical framework, assumptions, and methodologies that are directly applicable to the City of Pomona. The City relies on **Part 1** of the RUWMP for the lay description, regional water supply availability, and the underlying technical methodology used to evaluate water supply reliability under normal, single dry-year, multiple dry-year, and five-year drought stress-test conditions.

The water supply reliability assessment and Drought Risk Assessment (DRA) applicable to the City's Urban Water Management Plan (UWMP) are presented in plain language in **Part 1** of the 2025 RUWMP, specifically within Chapter 5.

Building upon that regional foundation, the City-specific supply and demand comparisons are presented in the tables within this UWMP. Unless otherwise noted, the conclusions of the regional water supply reliability assessment and DRA are directly applicable to the City and satisfy the requirements of the Urban Water Management Planning Act and the 2025 UWMP Guidebook. A completed DWR UWMP Compliance Checklist for the City is provided in **Part 4, Appendix D-1**.

1. System Description

This section describes the City's water system, service area, population demographics, local climate, and land uses.

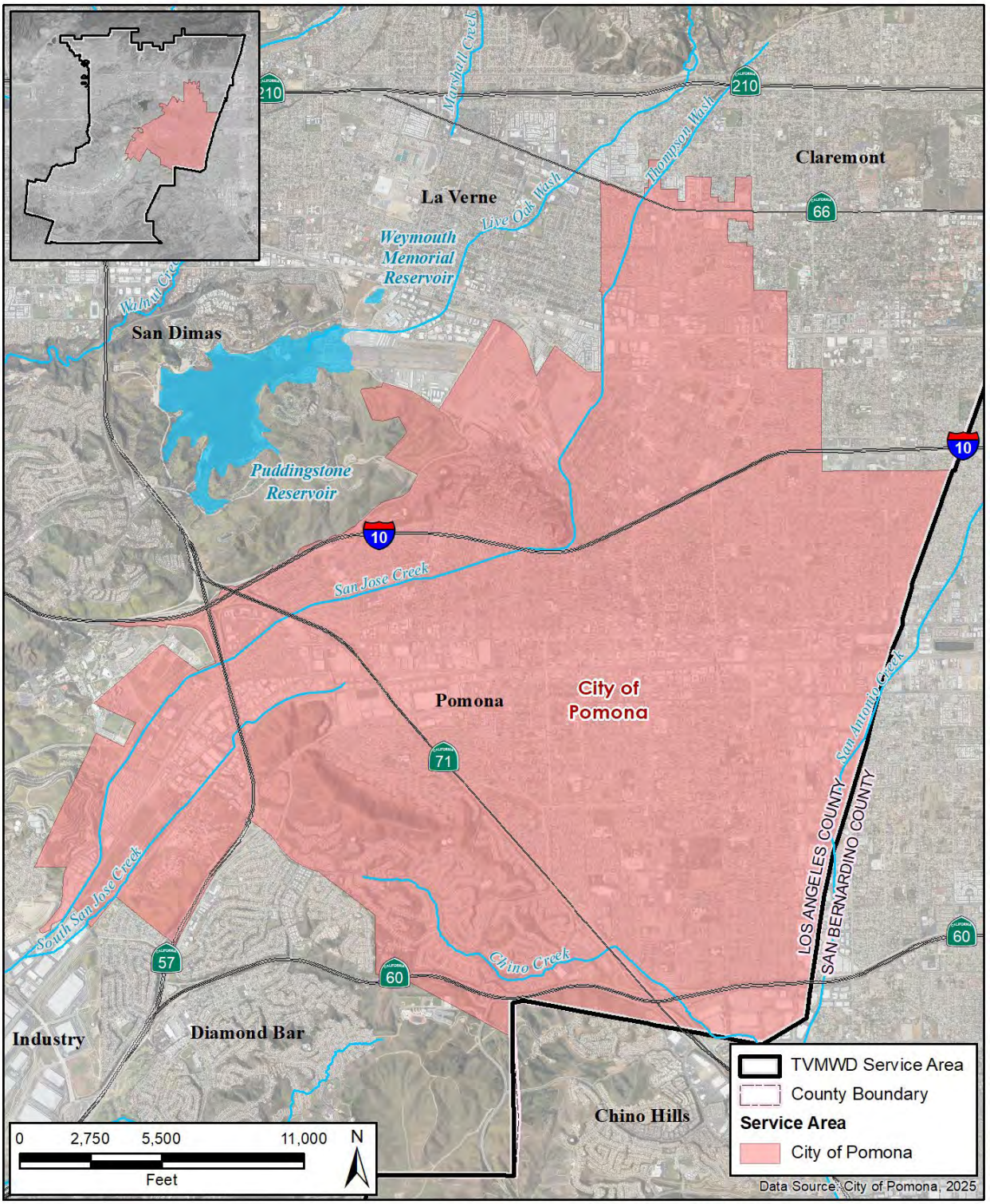
The City of Pomona was officially incorporated in January 1888 and became a charter city in March 1911. The City provides water service to a majority of residential, commercial, and industrial customers within the City of Pomona, located in the eastern portion of Los Angeles County, approximately 35 miles from downtown Los Angeles. In addition, the City also provides water service to portions of La Verne, Claremont, Montclair, and Chino Hills. The City's service area covers approximately 23 square miles and is bordered by several neighboring jurisdictions. To the north, it is bounded by the Cities of Claremont and La Verne; to the west, by the Cities of Industry, Walnut, and San Dimas; to the south, by Diamond Bar and Chino Hills; and to the east, by the City of Montclair. The City's service area is shown in **Figure 1-1**.

The City has a seven-member City Council. Six Council members are elected representing six different Districts and serve four-year terms. The City Mayor is elected at large every four years. The City Manager is appointed by the City Council. Other City managerial positions are filled by the City Manager. The Water Resources Department is responsible for the operation and management of the City's water and sewer system.

Demand within the City's service area is met through groundwater, local surface water, imported water, recycled water, and other non-potable supplies. The City's potable water system includes storage reservoirs, distribution pipelines, groundwater wells, booster pump stations, imported-water turnouts, interagency connections, permitted treatment facilities, spreading grounds, and pressure-regulating stations. The system includes approximately 6,000 fire hydrants and 421 miles of potable water pipelines.

The City's primary supply is groundwater pumped from the Chino Basin and Six Basins. Additional local surface water is obtained from San Antonio Canyon and Evey Canyon. To supplement these supplies, the City purchases treated imported water from the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD).

Figure 1-1. Service Area



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19Apr2026 RS

1.1. Service Area

The City is a retail public water supplier that meets the definition of an urban water supplier with 31,056 municipal water service connections in 2024. The regional climate, which includes the City's service area, is described in **Part 1 Chapter 2** of the 2025 RUWMP.

1.1.1. Population, Demographics, and Socioeconomics

Estimates of population served by the City are based on the 2020 U.S. Census Bureau and the Southern California Association of Governments (SCAG) (Southern California Association of Governments, 2024). A geographic information systems (GIS) analysis of 2020 Census data was used to determine the City's 2020 service area population, which was 150,777. The 2020 population and the number of residential connections served by the City in 2020 were used to derive a 2020 persons per residential connection factor of 5. This factor was then multiplied by the City's number of residential connections in 2025 to estimate the 2025 population served by the City. To project the population served by the City from 2030 to 2050, average annual population growth rates from SCAG projections were applied to this 2025 estimate. A GIS analysis of SCAG projection data was used to determine the SCAG growth rate specific to the City's service area. SCAG projected an increase in population from 2019 to 2035 averaging 0.38% per year and from 2035 to 2050 averaging 0.18% per year. Estimated current and projected populations of the City's service area are included in **Table 1-1**.

Table 1-1. Current and Projected Population

Population Served	2025	2030	2035	2040	2045	2050
Total	155,836	158,803	161,770	163,270	164,770	166,270

The estimated 2025 and projected future number of households and employees within the service area were estimated using the same approach as population. SCAG projected an increase in households from 2019 to 2035 averaging 1.49% per year and from 2035 to 2050 averaging 0.35% per year. SCAG projected an increase in employment from 2019 to 2035 averaging 0.39% per year and from 2035 to 2050 averaging 0.08% per year. The estimated number of households and employees were determined by linear interpolation between SCAG projections for 2019, 2035, and 2050 as shown in **Table 1-2**.

Table 1-2. SCAG Household and Employment Projections for Water Service Area

Category	2025	2030	2035	2040	2045	2050
Households	45,539	48,848	52,156	53,101	54,045	54,990
Employees	57,919	59,044	60,169	60,401	60,633	60,864

According to U.S. Census Bureau QuickFacts from 2024, the median household income in the City is $79,479. The City's poverty rate is 14%. The City is 16% white alone, 10% Asian alone, 5% black alone, 23% two or more races, and 71% Hispanic or Latino. The average commute to work for workers at least 16 years of age is 31 minutes, which indicates that most jobs are local (United States Census Bureau, 2024). According to 2024 U.S. Census Bureau QuickFacts, the City's population is made up of 13% of seniors (65 years and over), 22% of persons under 18 years, and 5% of persons under 5 years. (United

States Census Bureau, 2024). **Table 1-2** provides employment and household projections for the City's water service area based on SCAG GIS data intersected with the water service area.

1.1.2. Land Use

Per the Fiscal Year 2024-2025 Three Valleys Municipal Water District Assessed Service Area by Land Use, the City's land use distribution by parcel count is as follows:

- Single-Family Residential: 72%
- Multi-Family Residential and Condominiums: 18%
- Mobile Homes: <1%
- Commercial: 4%
- Churches: <1%
- Industrial: 3%
- Vacant Residential: 2%
- Vacant Non-Residential: 1%

2. Water Use

This section describes the current and projected water uses within the City's service area.

2.1. Water Use by Sector

2.1.1. Water Use Sectors Listed in Water Code

Water suppliers are required to identify water uses to the extent that records are available, for at least each of the water use sectors identified in CWC 10631(d) to assist in the water demand projections. The City primarily serves potable water to customers, though it does supply a small amount of recycled water. Recycled water uses are described in **Section 4.5**.

The City serves the following water uses:

Single Family Residential

Single family residential customers are typically on a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.

Multi-Family Residential

Multi-Family residential customers are typically multiple dwelling units within one building or several buildings within one complex.

Commercial

Commercial customers typically provide or distribute a product or service.

Government

Institutional water customers are typically public services, such as higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

Landscape Irrigation

City tracks the water use for landscape irrigation.

Losses

Distribution system water losses are the water losses from the point of water entry to the distribution system to the delivery point to the customer's system. Water losses are discussed in **Section 2.1.3**.

The number of active connections is shown in **Table 2-1**.

Table 2-1. Fiscal Year 2021-2025 Connections by Customer Class

Customer Class	2021	2022	2023	2024	2025
Residential – Single Family	24,574	24,593	24,137	24,385	24,385
Residential – Multi-Family	2,466	2,484	2,487	2,492	2,492
Recycled	6	6	7	7	7
Government	417	416	391	400	400
Commercial	3,164	3,146	3,157	3,162	3,162
Irrigation	610	610	610	610	610
Total	**31,237**	**31,255**	**30,789**	**31,056**	**31,056**

2.1.2. Past and Current Water Use

The City serves potable water for a variety of uses, as summarized in **Table 2-2**. Over the past five years, the City served an average of 17,168 AFY of potable water. In 2025, 67% of the total potable water deliveries were to residential customers (47% to single-family accounts and 20% to multi-family accounts). **Table 2-2** shows the annual volume of water used by each customer class for 2025.

Table 2-2. DWR 4-1R Actual Demands for Water, 2025, AFY

Use Type	Potable or Non-Potable (*optional)*	2025 Volume
Single Family	Potable	8,160
Multi-Family	Potable	3,557
Commercial	Potable	3,223
Institutional	Potable	1,187
Landscape	Potable	1,392
Distribution System Water Loss	Potable	779
	Total	**18,298**

2.1.3. Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. The City monitors its water loss and prepares an annual AWWA Water Audit to estimate the volume of water loss. The City has submitted all required water loss audits to the State, as shown in **Table 2-3**. Copies of the City's recent AWWA audits are provided in **Part 4, Appendix D-6**.

Table 2-3. DWR 4-5R Month Water Loss Audit Reporting

Public Water System ID # Reported in DWR Table 2-1R	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910126	2020	Yes
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes

DWR Notes:
2020 AWWA: Pomona City of CY2020 Version 5 - DM Updated 9-30-2021.xlsx
2021 AWWA: Pomona City of CY2021 Version 5.xlsx
2022 AWWA: CY2022_Pomona_Water Audit_v6..xlsx
2023 AWWA: CY2023_Pomona_Water Audit_v6.0.xlsx
2024 AWWA: City of Pomona Water Loss Audit CY 2024 v6.0.xlsx

CWC Section 10608.34 required the State Resources Control Board (State Board) to develop water loss performance standards for urban retail water suppliers to minimize water waste through system leaks. Water loss performance standards were developed through a rulemaking that became effective in 2023. Under the regulations, each supplier will be required to comply, by 2028, with an individualized volumetric water loss standard based on real loss, using the economic model developed by the State Board and the supplier's own unique data. Real loss is the physical loss of water from water distribution systems, as opposed to apparent losses, which are revenue losses due to meter inaccuracies, billing errors or unauthorized consumption. A supplier's baseline water loss is calculated as the average water loss from at least 3 of the 4 water loss audits from 2017 – 2020. The real water loss performance standard is based on gallons per service connection per day (gpscd), or gallons per mile of pipe per day (gpmd), depending on how the supplier reports real loss. Post-2028 compliance with volumetric water loss standards will be assessed every three years based on the average of the supplier's real loss from the preceding three years, with an allowed variation of 5 gallons per connection per day above the supplier's water loss standard. Apparent loss standards are equal to the baseline apparent loss and compliance is evaluated at the same time as compliance with the Real Water Loss Performance Standard.

Although the compliance period has not yet started, CWC Section 10631 (d)(3)(C) requires water suppliers to provide data in the UWMP to show whether the supplier met its State Board water loss performance standard.

Over the last five years, the City's water losses have ranged from 4% to 12% when calculated as the difference between billed consumption and total production. To project the water loss component of future demands, the City assumed future water losses will be approximately 6% of total customer water use. Calculated water losses are shown in **Table 2-4**.

Based on data released by the State on January 30, 2026, the City's baseline real water loss is 22.4 gpscd and the real water loss standard is 21.7 gpscd, and the apparent loss standard is the baseline of 13.1 gpscd. No reduction from the baseline is required to meet the water loss standard by 2028. As shown in **Table 2-5**, based on the most recent water loss audit from 2024, the City has not yet met the apparent

water loss performance standard, but is working toward that goal by 2028. **Section 8.1.5** discusses City's programs to assess and manage distribution system real loss.

Table 2-4. Calculated Water Loss

Water Loss	2021	2022	2023	2024	2025
Calculated Water Loss	1,214	1,150	607	1,966	779
% Water Loss	6%	6%	4%	12%	4%

Table 2-5. DWR 4-6R Progress Towards 2028 Water Loss Standard

Public System ID # Reported in Submittal Table 2-1R	Did the Water Board Calculate a Water Loss Standard for this Public System?	2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Standard	Number of Units	Volume of Total Real Water Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Real Water Loss per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Apparent Water Loss per Unit per Day
CA1910126	Yes	21.7	gpscd	30,796	493	14.3	13.1	gpscd	30,796	923	26.8

2.2. Projected Water Use

As shown in **Figure 2-1**, total water demand has trended downward since 2015, which is most likely due to permanent conservation in response to droughts, state mandated water use reduction targets, more efficient appliances and plumbing, and conservation efforts made by the City and its customers. The City anticipates that demands may continue in alignment with historic patterns. Therefore, demands used for the purposes of this UWMP are assumed to reduce by 2 gallons per capita per day (GPCD) per five-year planning period from 2025, which is 105 GPCD. This results in 103 GPCD in 2030, declining approximately 2 GPCD every five years until it reaches 95 GPCD in 2050. Population projections as described in **Section 1.1.1** are applied to these GPCD values to project future demands. The assumed future water loss of 6% described in the previous section was applied to the subtotal of demand for all connection types to estimate future water losses. **Table 2-6** presents the projected demand by customer type through 2050 for this UWMP.

Figure 2-1. Historical and Projected Demand

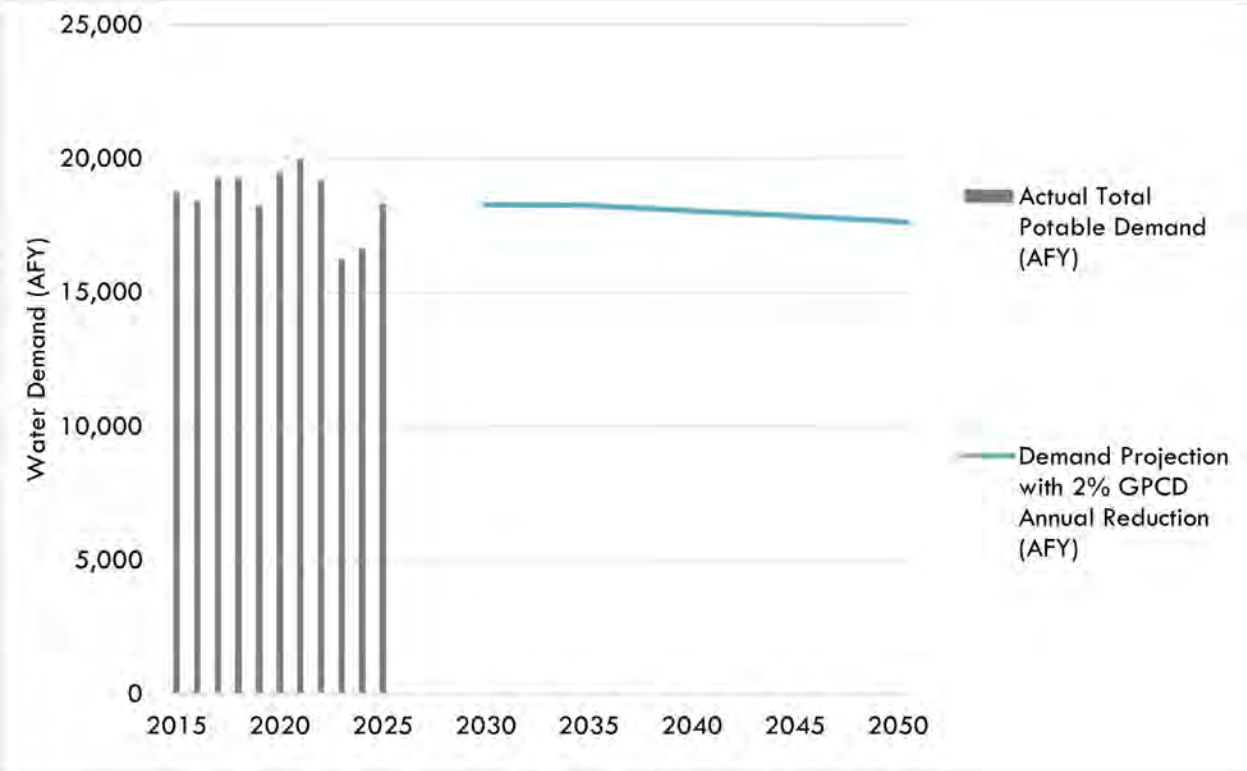


Table 2-6. DWR 4-2R Projected Demands for Potable Water, AFY

Use Type	Additional Description	Level of Treatment When Delivered	Projected Water Use 2030	Projected Water Use 2035	Projected Water Use 2040	Projected Water Use 2045	Projected Water Use 2050
Single Family		Potable	8,178	8,164	8,075	7,986	7,897
Multi-Family		Potable	3,529	3,523	3,484	3,446	3,408
Commercial		Potable	3,062	3,057	3,024	2,991	2,957
Institutional		Potable	1,100	1,098	1,086	1,074	1,063
Landscape		Potable	1,248	1,245	1,232	1,218	1,205
Distribution System Water Losses		Potable	1,157	1,155	1,143	1,130	1,117
		Total	**18,273**	**18,242**	**18,043**	**17,845**	**17,647**

Table 2-6 and **Table 2-7** satisfy the requirement to include anticipated water conservation savings when developing future demand projections for the next 25 years since they reduce by 2% GPCD per year from 2025. The City is complying with and planning for UWUO standards as described in **Sections 3 and 8**.

Senate Bill 1087 requires that water use projections in an Urban Water Management Plan (UWMP) include projected water use associated with single family and multi-family residential housing for lower income households, as identified in the housing elements of any city, county, or city and county within the supplier's service area. The Regional Housing Needs Assessment (RHNA) establishes housing needs for each jurisdiction over the applicable planning period. SCAG adopted the 6th Cycle RHNA Allocation Plan, which covers the planning period from October 2021 through October 2029 (Southern California Association of Governments (SCAG), March 2021). SCAG's population and household projections inform the RHNA Allocation Plan and are used in the determination and allocation of housing needs, including lower income housing, for individual jurisdictions. The growth projections in this UWMP are based on SCAG projections for the service area and therefore also incorporate the lower income housing projections. The projected demands in this UWMP represent water use from all future growth and are inclusive of water use for lower income households.

Table 2-7. DWR 4-3R Inclusion in Water Use Projections

Question	Yes or No
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included in Projections?	Yes

2.3. Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. A recent Climate Change Vulnerability Assessment utilizing data from DWR and 20 global climate models suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1, Chapter 2** of the 2025 RUWMP includes an assessment of the potential impacts of climate change.

3. SB X7-7 Compliance & Future Water Use Efficiency Requirements

This section describes compliance with the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7). The section demonstrates compliance with the 2020 SBX7-7 target and discusses future water use efficiency requirements.

3.1. Compliance and Future Water Use Efficiency Requirements

SBX7-7 was incorporated into the UWMP Act in 2009 and required that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20% by the year 2020.

SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, March 2021) specify methodologies for determining the baseline water demand, 2015 interim urban water use target, and the 2020 urban water use target for the City as described in the 2020 UWMP. This section also demonstrates that the City achieved its 2020 water use target.

Table 3-1 below establishes the City's 2020 actual and 2020 target GPCD. As shown, the City met its 2020 target. Most recently, in 2025, the water use was 105 GPCD, which is well below the 2020 target of 147 GPCD.

Table 3-1. SB X7-7 2020 Target Progress

2020 Target GPCD	2020 Actual GPCD	Did Supplier Achieve Target?
147	113	Yes

New water use efficiency standards from the "Making Conservation a California Way of life Regulation" (CWOL Regulation) supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the "2018 Water Conservation Legislation." Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation, each urban retail water supplier must comply with its UWUO. DWR and the State Board have developed a reporting framework for calculating the UWUO and compliance annually with efficiency standards becoming increasingly stringent through 2040.

The demand projections in this UWMP are based on the City meeting its estimated future UWUO, as described in **Section 2.2** in order to plan and implement necessary demand management measures (DMMs) (described in **Section 8**) to support meeting the UWUO. DMMs and UWUO compliance planning enhance resiliency for drought and other water shortage conditions as described in **Sections 5, 7, and 8**.

4. Water Supply

The City's primary sources for water supply include treated imported water purchased from MWD through TVMWD, groundwater pumped from Chino Basin, Spadra Basin, and Six Basins, local surface water from San Antonio Creek, and recycled water purchased from the Los Angeles County Sanitation Districts (LACSD). The City's main source of water supply is groundwater pumped from the Chino Basin. More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2025 RUWMP.

4.1. Purchased or Imported Water

The City purchases treated imported water from MWD through TVMWD. MWD imports water from the Colorado River through the Colorado River Aqueduct (CRA), owned and operated by MWD, and the State Water Project (SWP), which utilizes the CRA for transmission to Southern California. Water delivered to TVMWD's member agencies can receive treated imported water from MWD's Weymouth Treatment Plant located in the City of La Verne or from TVMWD at its Miramar Water Treatment Plant located in the City of Claremont.

The City's treated imported water supplies from MWD, through TVMWD, may be impacted during a multi-year drought or other conditions which limits MWD from delivering sufficient water supplies to its member agencies, and consequently to the City. A description of this supply and its reliability is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the 2025 RUWMP**.**

4.2. Groundwater

The City holds groundwater rights in three regional groundwater basins: Chino Basin, Six Basins, and Spadra Basin, though the City does not currently extract from the Spadra Basin. All three basins have been adjudicated and are managed for long-term sustainability, as discussed further in **Part 1 Chapter 3** of the RUWMP.

4.2.1. Chino Basin

The City currently produces groundwater from the Chino Basin, which is a sub-basin of the Upper Santa Ana Valley Groundwater Basin and is managed by the Chino Basin Watermaster.

The Chino Basin Judgment originally established a Safe Yield for the Chino Basin of 140,000 AFY. Pursuant to the most recent Safe Yield reset effective in 2020, the Safe Yield in the Chino Basin is currently 131,000 AFY (July 1 to June 30). The Safe Yield is recalculated every 10 years and is defined in the Chino Basin Judgment as "the long-term average annual quantity of ground water (excluding replenishment of stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Chino Basin under conditions of a particular year without causing an undesirable result". The Chino Basin Judgment's allocation of the Safe Yield includes three separate Pools: (1) the "Overlying Agricultural Pool"; (2) the "Overlying Non-Agricultural Pool"; and (3) the

"Appropriative Pool". At this juncture, the Chino Basin Watermaster is in the process of a Safe Yield reevaluation and has provided an estimated Safe Yield of 117,500 AFY.

The City's percent share of the Operating Safe Yield (OSY) is 20.454%.

4.2.2. Six Basins

The City also produces groundwater from Six Basins. Six Basins is a group of six interconnected groundwater basins that underlie areas of the Cities of Claremont, La Verne, Pomona, and Upland, and surrounding unincorporated areas of Los Angeles and San Bernardino Counties. The City currently produces groundwater from 9 wells located in the Upper Claremont Heights, Lower Claremont Heights, and Pomona Basins.

A court-appointed Watermaster is responsible for the administration of the Six Basins Judgment. Pursuant to the Judgment, the safe yield of the Six Basins is 19,300 AFY, which is defined as the amount of water that can be produced from the parties on an annual basis to ensure long-term, sustainable groundwater production. The production, replenishment, and recovery of the Live Oak and Ganesha Basins (collectively referred to as Two Basins) are reserved solely for the City of La Verne and are not subject to any groundwater production limitations, provided that production by the City of La Verne does not substantially injure the rights of any other Six Basin parties. However, the Canyon, Upper Claremont Heights, Lower Claremont Heights, and Pomona Basins (collectively referred to as Four Basins) are subject to individual OSYs determined annually by the Six Basins Watermaster.

The City's percent share of the OSY is 20.798%. As described in **Part 1, Chapter 3**, the City is allowed to carry over portions of its unused Six Basins annual pumping rights for up to one year. Carryover rights are limited to a maximum of 25% of the City's share of the OSY. However, any amount extracted in excess of the water rights will then be deducted from the following year's water rights.

4.2.3. Spadra Basin

The City currently does not produce groundwater from the Spadra Basin. Groundwater produced from the Spadra Basin for potable water uses requires treatment or blending prior to use to comply with SWRCB-DDW drinking water standards. As a result, groundwater produced from the Spadra Basin is used primarily for non-potable overlying uses by local water agencies. This basin is unadjudicated and is discussed further in **Part 1, Chapter 3** of the RUWMP.

Table 4-1 summarizes the City's actual groundwater production over the past five years. Pumping volumes fluctuate annually based on total system demand, the availability of surface water, and local hydrological conditions.

Table 4-1. DWR 6-1R Groundwater Pumped Last Five Years (AF)

Groundwater Type	Location or Basin Name	2021	2022	2023	2024	2025
Alluvial Basin	Chino Basin	9,182	10,159	10,189	10,449	9,796
Alluvial Basin	Six Basins	3,447	3,120	2,075	3,066	3,792
	Total	**12,629**	**13,279**	**12,264**	**13,515**	**13,588**

4.3. Surface Water

The City has surface water facilities which are located near the base of the San Antonio Canyon and Evey Canyon watersheds that discharge runoff from the San Gabriel Mountains into local spreading grounds through the San Antonio Creek. The amount of surface water runoff that is discharged to the San Antonio Creek is dependent on local precipitation and snowmelt from the San Gabriel Mountains. The City owns the water rights to 40% of the first 8.09 MGD (9,055 AFY) of flow from the San Antonio Creek and owns the rights to receive all the water from the Evey Canyon. The City has the infrastructure to produce up to 4,000 AFY of that surface water for supply.

The City's surface water facilities include: (1) an intake/weir structure at the San Antonio Canyon; (2) the City's Pedley Filtration Plant (PFP) located in the City of Claremont; and (3) the Canon Waterline that connects the San Antonio Canyon and Evey Canyon watersheds to the PFP. The intake/weir structure at the San Antonio Canyon distributes the flow between the San Antonio Water Company and the City (i.e. 40%). From there the City's water travels in a pipeline south where water from Evey Canyon is added. A Canon Waterline transfers the raw surface water collected from both watersheds to the PFP for treatment. At the PFP, the waterline discharges into a diversion structure which transfers all instantaneous flows less than or equal to 4 MGD into the PFP. Flows greater than 4 MGD are diverted to the Pomona Spreading Grounds, located adjacent to the PFP.

4.4. Stormwater

The City does not directly use stormwater to meet its water demands.

4.5. Wastewater and Recycled Water

Wastewater generated by the City is collected within the City's local sewer collection system and treated by LACSD. The City provides sewer service to an area of approximately 14,680 acres within the City limits and approximately six acres outside of the City limits. Approximately 2,000 acres in the City drain to other serving entities or currently produce no sewage.

The City's local sewers tie into LACSD's regional trunk sewers – which convey flows to the Pomona Water Reclamation Plant (PWRP) and the LACSD Joint Water Pollution Control Plant (JWPCP) – at approximately 200 locations within the City. The percentage of flows to each plant is not specified.

The City currently has the right to purchase and sell two-thirds of PWRP's recycled water. PWRP has a capacity to treat 15 MGD of wastewater and produces an average of 9 MGD of recycled water. Based on

this average production rate, the City has approximately 6 MGD available for beneficial reuse. The estimated amount of wastewater collected by the City in 2025 was approximately 2,500 MG (about 7,672 AF).

Table 4-2 and **Table 4-3** show existing wastewater collection and treatment at the Pomona Water Reclamation Plant.

The City also has seven non-potable wells available for use in its recycled water system. The City currently provides recycled water to customers inside and outside of the City's service area. The City's distribution system is located entirely within the City's municipal boundaries where it delivers recycled water to two booster pumping stations that serves the following locations outside of the City's municipal boundaries:

- **California State Polytechnic University (Cal Poly)**: This pump station is located southwest of the interchange of the 10 Freeway and the 57 Freeway. Recycled water is boosted to a recycled water reservoir on the western part of the campus through a pipeline owned and operated by the university. The University provides recycled water to the Forest Lawn Memorial Park in Covina.
- **Bonelli Park**: This pump station is located south of the 10 Freeway and west of the 57 Freeway. Recycled water is boosted to a recycled water reservoir in Bonelli park, serving Bonelli Park, the East Shore Recreational Vehicle Park, and the Mountain Meadows Golf Course.

The City's recycled water system facilities are either City-owned or customer-owned. Active City-owned facilities include the PWRP booster pump station, a 0.7 MG reservoir, and 3 MG reservoir. Customer-owned facilities include reservoirs and booster pump stations owned and operated by California State Polytechnic University, Pomona; Bonelli Park; and Caltrans. The City's recycled water system operates primarily to distribute recycled water from PWRP to its customers. Historically, recycled water use within the City's service area has been used mainly for irrigation, with some commercial and industrial users.

4.5.1. Potential, Current, and Projected Recycled Water Uses

Currently, the City delivers recycled water to several locations for use in agricultural and landscape irrigation, ornamental plant irrigation, impoundment, and athletic field irrigation. The City's 2009 Recycled Water Master Plan identifies potential recycled water users (City of Pomona, 2009). The City is currently preparing a "Water, Sewer and Recycled Water Strategic Plan" to modify the recycled water system to include projects pending additional funding.

Table 4-2. DWR 6-2R Wastewater Collected within Service Area in 2025 (AF)

Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated	Volume of Wastewater Collected from UWMP Service Area 2025	Name of Wastewater Treatment Plant (WWTP) and Place ID Number	Is WWTP Located Within UWMP Area?
LACSD	Metered	7,672	PWRP, Place ID 250700	Yes
	Total	**7,672**		

Table 4-3. DWR 6-3R Wastewater Treatment and Outcomes Within Service Area in 2025 (AF)

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area?	2025 Volume of Wastewater Received from UWMP Service Area (As Reported in Submittal Table 6-2)	Total 2025 Volume of Water Treated	Treatment Level	2025 Outcomes of Treated Wastewater Recycled within Service Area	2025 Outcomes of Treated Wastewater Recycled Outside of Service Area	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use	2025 Outcomes of Treated Wastewater Instream Flow Permit Required	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment
Pomona Water Reclamation Plant, Place ID 250700	YES	7,672	4,987	Tertiary	1,423	3,564			
				Total	**1,423**	**3,564**			

4.6. Water Exchanges and Transfers

The City is currently able to exchange surface and/or groundwater with the following utilities:

- City of Upland: Groundwater between Six Basins and Chino Basins -- Existing groundwater agreements include the "bucket for bucket" exchanges with the City of Upland.
- San Antonio Water Company: Surface water - Canon Water Line diverted and exchanged for 110% of groundwater credit in the Six Basins.

In addition, the City participates in MWD's Dry-Year Yield Program (DYYP). The DYYP is a groundwater storage and recovery program where supplemental water is stored in the Chino Basin during surplus years and could be recovered in-lieu of imported water from MWD through Inland Empire Utilities Agency (IEUA). The DYYP allows maximum use of imported water supplies available during wet years and stored groundwater in the Chino Basin during dry years. The DYYP can store up to 100,000 AF with maximum replenishment of 25,000 AFY and maximum extraction of 33,000 AFY. Based on the Chino Basin Watermaster 2024/2025 Assessment Package, during FY 2023-2024, there was 45,908.2 AF within the DYYP account. The agreement that authorized the DYYP will expire in 2028.

Water rights under the Six Basins Judgment can be transferred by assignment, sale, contract, or lease so long as such transfers meet the requirements of the Judgment. However, a Party's right to produce, store or recover groundwater in the Four Basins Area may not be transferred, exchanged or exercised in the Two Basins Area. In addition, a Party's right to produce, store or recover groundwater in the Two Basins Area may not be transferred, exchanged or exercised in the Four Basins Area. The City is able to utilize the transfer opportunities available for Six Basins water when necessary.

4.7. Future Water Projects

As part of the TVMWD Water Resources Master Plan (WRMP) and Drought Contingency Plan (DCP) with the member agencies, the City is currently pursuing several projects to increase water supply reliability (TVMWD, 2025). Future projects include:

- The City is planning to implement groundwater quality improvement measures, including the Anion Exchange Plant and enhancements to Reservoir 5. The project includes the installation of new extraction wells, enhancement of well efficiency, upgrades to aging infrastructure, and groundwater treatment. This project is expected to increase overall supply by approximately 5,300 AF.
- Reservoir 6 roof replacement, which upgrades aging infrastructure.

Four regional water supply projects were also identified in the WRMP and DCP effort through collaboration with TVMWD, member agencies, and regional stakeholders. These regional projects, described in **Part 1, Chapter 3**, are intended to enhance overall supply reliability for the region.

- Project 1: External Partnership with CVWC – Main Basin
- Project 2: TVMWD Groundwater Reliability Improvement Program (GRIP)

- Project 3: TVMWD Storing Water in Main San Gabriel Basin (GRIP+)
- Project 4: TVMWD–Pomona Chino Basin Conjunctive Use Exchange

As development progresses and increased demands are placed on the system, the City will determine which projects to implement.

4.8. Summary of Existing and Planned Sources of Water

The City's water supply is comprised of treated imported water, groundwater, local treated surface water, and recycled water. The volume of water utilized from each source in 2025 is summarized in **Table 4-4**, and projected supply is summarized in **Table 4-5**.

Table 4-4. DWR 6-8R Actual Water Supplies in 2025 (AF)

Water Supply	Additional Detail on Water Supply	2025 Actual Volume	2025 Potable or Non-Potable (optional)	2025 Total Entitlement (optional)
Groundwater (not desalinated)	Chino Basin	9,796	Potable	
Groundwater (not desalinated)	Six Basins	3,792	Potable	
Surface Water	San Antonio Creek	1,683	Potable	
Recycled Water	Pomona Water Reclamation Plant	1,849	Non-Potable	
Purchased or Imported Water	Metropolitan Water District – TVMWD	3,027	Potable	
	Total – Potable	**18,298**		
	Total – Non-Potable	**1,849**		
	Total	**20,147**		

Supply Projection Methodology

To project future water supplies accurately and conservatively, the City, in coordination with TVMWD, evaluated supply projection methodologies. Rather than projecting supplies based on maximum legal entitlements or absolute physical extraction capacity, the City opted to utilize a "Real Water" (Utilization-Based) approach. This approach grounds future projections in empirical operational reality. The methodology utilized a baseline representing the City's average local supply utilization over the most recent five-year period (2021–2025), which was 20,327 acre-feet per year (AFY). This baseline smoothed out historically dry years (e.g., 2021) and historically wet years (e.g., 2023).

To calculate the projected supplies shown in **Table 4-5**, the following steps were applied:

1. **Climate Change Adjustments:** Specific climate change vulnerability factors, derived from TVMWD's 2024 Climate Vulnerability Analysis, were applied to the 2021-2025 baseline local agency supplies (Chino Basin, Six Basins, and Spadra Basin groundwater, and San Antonio Creek surface water) to forecast anticipated local yields through 2050.

2. **Imported Water Reliance:** The projected local supplies were then compared against the City's projected demand. Any projected unmet demand is assumed to be fulfilled by imported water purchases from TVMWD.

Potable and Non-Potable System Accounting

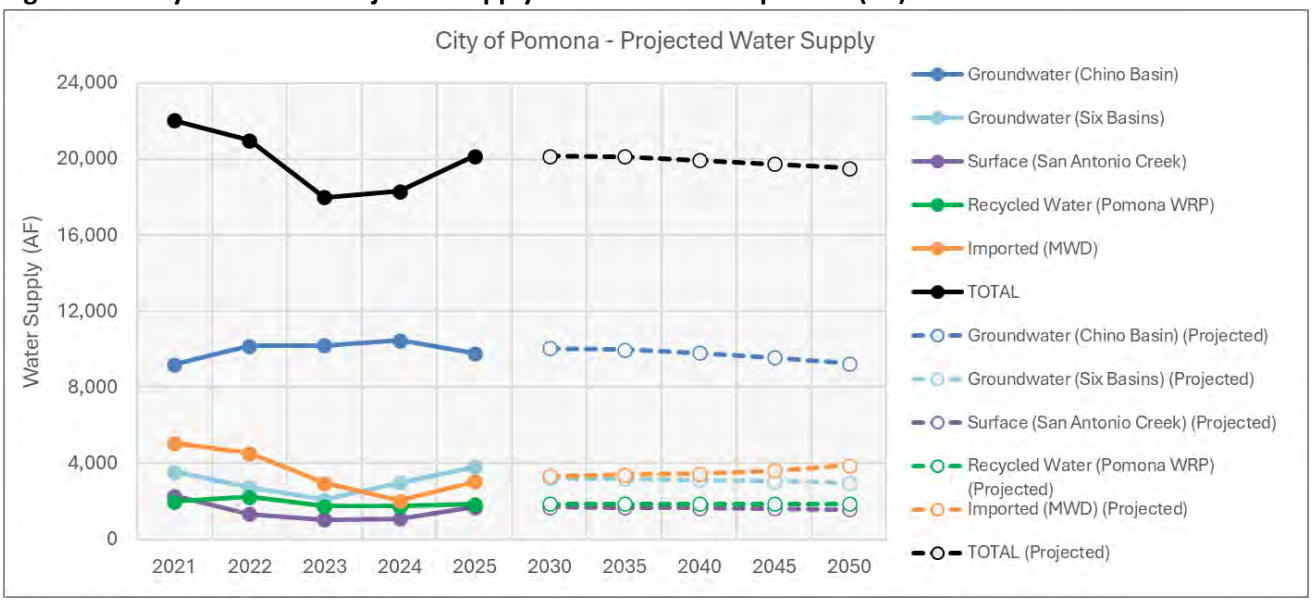
Because the City operates physically separate potable and non-potable distribution systems, the total projected supplies shown in **Table 4-5** reflect an aggregation of both systems. To accurately reflect this separation for planning purposes, projected recycled water and non-potable groundwater supplies are scaled to strictly equal the projected non-potable demands. The remaining supplies are dedicated exclusively to the potable system. There is no crossover of non-potable supplies to meet potable demands, maintaining a transparent and accurate projection of supply sufficiency for each distinct system.

As shown in **Table 4-5** and **Figure 4-1**, the City's reliance on local groundwater and surface water is projected to decrease slightly over time under a climate change planning scenario that models potential impacts to local hydrology. Under this specific scenario, imported water purchases from TVMWD are projected to increase modestly to balance the City's overall supply portfolio and meet customer demands. It is important to note that these projections are intended for long-term vulnerability planning purposes only; they do not incorporate future adaptation or mitigation strategies currently being developed or implemented at the regional level. Future actions, such as those identified in the DCP, are specifically designed to reduce or offset these potential climate-related impacts to local supplies.

Table 4-5. DWR 6-9R Projected Water Supplies (AF)

Water Supply	Additional Detail on Water Supply	2030	2035	2040	2045	2050
Groundwater (not desalinated)	Chino Basin	10,050	9,970	9,800	9,555	9,239
Groundwater (not desalinated)	Six Basins	3,216	3,190	3,136	3,057	2,956
Surface Water	San Antonio Creek	1,691	1,674	1,649	1,616	1,576
Recycled Water	Pomona Water Reclamation Plant	1,874	1,874	1,874	1,874	1,874
Purchased or Imported Water	Metropolitan Water District – TVMWD	3,315	3,408	3,458	3,617	3,876
	Total – Potable	**18,273**	**18,242**	**18,043**	**17,845**	**17,647**
	Total – Non-Potable	**1,874**	**1,874**	**1,874**	**1,874**	**1,874**
	Total – All	**20,147**	**20,116**	**19,917**	**19,719**	**19,521**

Figure 4-1. City of Pomona Projected Supply and Demand Comparison (AF)



4.9. Energy Intensity of Water Supplies

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2025, the City consumed approximately 470 kWh of energy for water facilities per AF of water delivered.

5. Water Service Reliability Assessment

This section considers the City's water supply reliability during normal years, single dry years, and up to five consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from the City's current source of supply through 2050.

5.1. Constraints on Water Sources

While the City maintains a highly reliable water portfolio, its supply sources are subject to various environmental, regulatory, and infrastructural constraints. A comprehensive analysis of regional water supply constraints is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the 2025 RUWMP.

For the City of Pomona specifically, the primary constraints on water sources include:

- **Imported Water Supply Reductions:** As detailed in **Part 1, Chapter 3**, MWD typically buffers statewide supply cuts using its massive regional storage portfolio. However, during severe multi-year droughts when State Water Project (SWP) and Colorado River allocations are drastically reduced by the State, the City may face constraints on the volume of imported water available from MWD through TVMWD. To offset these potential imported water constraints, the City actively manages its diverse portfolio, relying on its local groundwater reserves, recycled water, and programs like MWD's Dry-Year Yield Program (DYYP) in the Chino Basin.
- **Groundwater Quality:** Contaminants such as volatile organic compounds (VOCs), nitrate, perchlorate, and arsenic in the local groundwater basins (Chino, Six Basins, and Spadra Basins) can force the City to temporarily remove active extraction wells from service. To mitigate this constraint and maximize local supply reliability, the City is actively investing in wellhead treatment and infrastructure upgrades, such as the **4.7**construction of wellhead treatment at Well 36 in the Chino Basin.
- **Climate Change Impacts on Surface Water:** The City's local surface water supply from San Antonio Creek and Evey Canyon is dependent on local precipitation and snowmelt from the San Gabriel Mountains. As identified in **Part 1, Section 2.5**, this source is highly susceptible to climate-driven volatility, including shorter rainy seasons, reduced snowpack, and severe post-wildfire turbidity, which can temporarily halt treatment operations at the City's PFP.

5.2. Year Type Characterization

In general, groundwater and recycled water are less vulnerable to seasonal and climatic changes than surface water (i.e., local mountain runoff and imported supplies). The Chino Basin Watermaster and Six Basins Watermaster actively monitor groundwater levels and implement supplemental recharge to maintain the long-term sustainability of the City's primary local groundwater sources. Further discussion of regional water resource management is included in **Part 1 Chapter 3** of the RUWMP.

Because the City's baseline years are a mix of different hydrologic conditions, it is important to note how the City's supply strategy adapts to dry years. The City's primary local groundwater supplies, the Chino Basin and the Six Basins, have variable OSYs that may decline during dry periods. However, under the respective adjudication frameworks for these basins, the City can legally and physically continue to produce the water it needs to meet elevated dry-year demands by paying replenishment or replacement water assessments for any production that exceeds its rights. As a result, the City's operational supply strategy is not significantly different in dry years compared to normal years. The changes in the City's projected baseline supply over time are primarily driven by long-term climate change factors (as detailed in **Section 4.8**) and planned infrastructure projects.

Per UWMP requirements, the City has evaluated reliability for an average year, single dry year, and a five consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** The single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** The driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

To characterize these year types, the City evaluated historical supply and demand data. For the purposes of this 2025 UWMP, the City established a "Normal Year" baseline using the average annual supply and demand from 2021 through 2025.

Because water demand in the City typically increases during dry years due to elevated outdoor irrigation needs, the "Single Dry Year" and "Five-Year Drought" scenarios are modeled using historical years where production peaked to meet elevated drought demands. **Table 5-1** summarizes the base years utilized for this analysis and the corresponding volume of water available/utilized as a percentage of the average year.

Table 5-1. DWR 7-1R Basis of Water Year Data

Year Type	Base Year (FY)	Volume Available (AF)	% of Average Supply
Average Year	2021-2025	20,327	100%
Single-Dry Year	2021	22,029	108%
Consecutive Dry Years 1st Year	2018	21,276	105%
Consecutive Dry Years 2nd Year	2019	19,782	97%
Consecutive Dry Years 3rd Year	2020	21,174	104%
Consecutive Dry Years 4th Year	2021	22,029	108%
Consecutive Dry Years 5th Year	2022	20,981	103%

5.3. Water Service Reliability

The results of the reliability assessment are summarized below.

As established in **Section 4.8 and Part 1, Chapter 5**, the City utilized the "Real Water" (Utilization-Based) methodology to project its future supplies. Under this operational approach, the City projects its local groundwater, local surface water, and recycled water supplies based on historical averages adjusted for climate change. Any remaining unmet demand is fulfilled by purchasing imported water from TVMWD.

The City's projected "Normal Year" water demands over the next 25 years were developed using a demand-per-connection approach as discussed in **Section 4.8** and **Section 5.2**. This approach utilizes a baseline period of 2025 to approximate normal demand patterns, projects future connections based on SCAG growth rates and incorporates anticipated reductions due to passive conservation and compliance with the new "Making Conservation a California Way of Life" (CWOL) regulatory framework.

To estimate projected demands during drought conditions, the City utilized a historical ratio methodology. Because water demand in Southern California typically increases during hot, dry periods due to elevated outdoor irrigation needs, the City analyzed the ratio of total water utilized during historical dry periods compared to a historical average year.

Based on the City's operational data, the historical average year baseline was established using the five-year period of FY 2021–2025 (averaging 20,327 AF).

- **Single Dry Year Scaling:** The ratio of water utilized during the historical single dry year of FY 2021 (22,029 AF) to the historical average (20,327 AF) yielded a scaling factor of 108%. This 108% factor was applied to the projected normal year demands to estimate the City's projected water demands during future single dry years.
- **Five-Year Drought Scaling:** To estimate demands during a five-consecutive-year drought, the City utilized the historical drought sequence from FY 2018 through FY 2022. The ratio of water utilized in each of these years (21,276 AF, 19,782 AF, 21,174 AF, 22,029 AF, and 20,981 AF, respectively) compared to the historical average yielded scaling factors of **105%, 97%, 104%, 108%, and 103%** for years one through five of the drought sequence, respectively. These factors were applied to the projected normal year demands to forecast future multi-year drought demands.

Because TVMWD and MWD have demonstrated 100% supply reliability to meet wholesale demands through 2050 (supported by MWD's 2025 UWMP supply reliability analysis (MWD, 2026)), the City's total supply is projected to perfectly meet its total projected demand across all hydrologic scenarios. Consequently, the difference between supply and demand in the tables below is zero, reflecting a fully reliable water portfolio through the 2050 planning horizon.

Potable and Non-Potable System Accounting

To accurately reflect the separation of the City's potable and non-potable distribution systems, the supply and demand totals presented in the reliability tables below assume that projected recycled water

supply strictly equals recycled water demand for non-potable uses. All other water supplies listed are utilized exclusively to meet potable demands. There is no crossover of non-potable supplies to meet potable demands; as such, the demonstrated supply reliability applies independently and sufficiently to both the potable and non-potable systems.

Table 5-2, **Table 5-3**, and **Table 5-4** summarize the City's projected water supplies and demands over the next 25 years in five-year increments. These tables demonstrate the City can reliably meet elevated water demands during normal years, single dry years, and five-consecutive-year drought periods over the next 25 years.

Table 5-2. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	20,147	20,116	19,917	19,719	19,521
Demand totals	20,147	20,116	19,917	19,719	19,521
Difference	0	0	0	0	0

*Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in Table 2-6. The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in Table 4-5.

Table 5-3. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	21,834	21,801	21,585	21,370	21,156
Demand totals	21,834	21,801	21,585	21,370	21,156
Difference	0	0	0	0	0

*Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6**. The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in Table 4-5.

Table 5-4. DWR 7-4R Multiple Dry Years Supply and Demand Comparison

Year	Totals	2030	2035	2040	2045	2050
First Year	Supply Totals	21,087	21,055	20,847	20,640	20,432
	Demand Totals	21,087	21,055	20,847	20,640	20,432
	Difference	0	0	0	0	0
Second Year	Supply Totals	19,607	19,577	19,383	19,190	18,998
	Demand Totals	19,607	19,577	19,383	19,190	18,998
	Difference	0	0	0	0	0
Third Year	Supply Totals	20,986	20,954	20,747	20,541	20,334
	Demand Totals	20,986	20,954	20,747	20,541	20,334
	Difference	0	0	0	0	0
Fourth Year	Supply Totals	21,834	21,801	21,585	21,370	21,156
	Demand Totals	21,834	21,801	21,585	21,370	21,156
	Difference	0	0	0	0	0
Fifth Year	Supply Totals	20,795	20,763	20,558	20,353	20,149
	Demand Totals	20,795	20,763	20,558	20,353	20,149
	Difference	0	0	0	0	0

*Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6**. The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-5**.

6. Drought Risk Assessment

The Drought Risk Assessment (DRA) is an analysis required for the 2025 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2026. While Section 5 evaluated long-term reliability through 2050, the DRA serves as an immediate stress test, focusing specifically on the five-year period from 2026 through 2030. The purpose of this assessment is to determine if the City anticipates any supply shortages in the immediate future that would necessitate triggering mandatory demand reduction measures outlined in the Water Shortage Contingency Plan.

6.1. Data, Methods, and Basis for Water Shortage Conditions

To conduct the DRA, the City utilized the same "Real Water" supply methodology and historical drought scaling factors detailed in **Section 4.8** and **Section 5**. The assessment simulates a severe, five-consecutive-year drought mirroring the hydrology of Fiscal Years 2018 through 2022.

Because hot, dry weather drives increases in outdoor irrigation, the City's unconstrained demands are projected to scale up significantly during this period (up to 108% of average baseline demand, as established in **Section 5.3**). The DRA tests whether the City's local groundwater, local surface water, recycled water, and imported water portfolios can sustain these elevated demands over the next five years without natural replenishment.

6.2. DRA Water Source Reliability

The City's near-term reliability is highly secure due to the active management of the Chino Basin, Six Basins, and Spadra Basin, the consistent utilization of recycled water, and the unprecedented storage reserves held by its wholesale providers.

Entering the 2026–2030 DRA period, MWD holds nearly 4 million acre-feet (MAF) of water in regional storage, which is a near-record high. MWD's 2025 UWMP DRA modeling confirms that even if the SWP and CRA experience five consecutive years of severe constraint, MWD has sufficient stored reserves to meet all wholesale member agency demands without shortage allocations through 2030. Consequently, TVMWD can reliably supply the City with imported water to cover any deficits caused by constrained local groundwater production.

6.3. Total Water Supply and Use Comparison

Table 6-1 details the DRA for the 2026–2030 period. As demonstrated in the table, the City's projected supplies are sufficient to fully and consistently meet the elevated, unconstrained demands for every year of the five-year drought sequence.

Because the City anticipates a supply surplus (a difference of zero) across all five years of the near-term drought scenario, the City does not currently project a need to implement mandatory, extraordinary conservation measures or trigger advanced stages of its WSCP due to supply shortages. However, the

City remains committed to ongoing water conservation and will continue to enforce standard water waste prohibitions to preserve regional storage.

Table 6-1. DWR 7-5 Five-Year Drought Risk Assessment (AF)

Category	2026	2027	2028	2029	2030
Total Water Use (Demand)	21,087	19,607	20,986	21,834	20,795
Total Supplies	21,087	19,607	20,986	21,834	20,795
Surplus/Shortfall without WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP – Supply Augmentation Benefit	0	0	0	0	0
WSCP – Use Reduction Savings Benefit	0	0	0	0	0
Revised Surplus/(Shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP Action	**0%**	**0%**	**0%**	**0%**	**0%**

7. Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) is a strategic plan developed by the City to proactively manage and respond to both anticipated and unforeseen water shortages. A water shortage is defined as a condition in which available water supplies are inadequate to meet expected customer demand at a specific point in time. Such shortages may result from various factors, including but not limited to, water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demand.

The City's WSCP is a detailed approach which presents how the City intends to act, or respond, in the case of an actual water shortage. It outlines a process for conducting annual water supply and demand assessments and establishes clearly defined stages and response measures to respond to actual conditions. This level of preparedness enhances transparency, ensures accountability, and supports the City's ability to maintain reliable water service during periods of supply disruption.

The WSCP was prepared in conjunction with the 2025 RUWMP and is presented as a standalone document that may be updated as necessary. No substantive changes have been incorporated into the 2025 WSCP compared to the 2020 version. Minor editorial updates were made for clarity and consistency; however, the content, procedures, and response actions remain relatively unchanged.

The City has consistently operated under a Level 2 watering schedule, as established by Ordinance 4122. During the most recent drought, Pomona implemented its WSCP without requiring any adjustments. Currently, the City is reviewing the requirements of Assembly Bill (AB) 1572. While the existing WSCP includes general conservation measures, it does not yet incorporate the specific definitions, exemptions, enforcement provisions, or timelines outlined in AB 1572. The City anticipates the need to amend Ordinance 4122 or adopt a new ordinance section to ensure full compliance with the legislation.

The City's WSCP is included in **Part 4, Appendix D-7**.

8. Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that the City has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. The City met the 2020 Water Use Target through the implementation of these DMMs. They City expects to continue to implement current conservation programs to encourage conservation and achieve its water use targets.

8.1. Existing Demand Management Measures

8.1.1. Water Waste Prevention Ordinances

The City adopted Ordinance No. 4122 ("Water Conservation and Water Supply Shortage Program and Regulations") in June 2009, which established regulations to prevent water waste. Ordinance No. 4122 includes the following restrictions:

- Limitations on watering hours for lawn, landscape, or vegetated areas.
- Limitations on watering duration to no more than 15 minutes per day per irrigation station.
- Prohibitions on excessive water flow or runoff.
- Prohibitions on washing down hard or paved surfaces (except for safety and sanitation with limitations).
- Prohibitions on excessive pipeline leaks, breaks or malfunctions and obligation to repair them in a timely manner.
- Prohibitions on operating a water fountain or other decorative water features that do not use re-circulated water.
- Limitations of washing vehicles.
- Prohibitions on serving drinking water at eating or drinking establishments (unless requested).
- Commercial lodging establishments must provide the option to not launder daily.
- Prohibitions on the installation of single pass cooling systems in buildings requesting new water service.
- Prohibitions on the installation of non-recirculating water systems in new commercial car washes, new laundry systems, or other new water intensive operations.
- Restaurants are required to use water conserving dish wash spray valves.

A copy of this Ordinance No. 4122 is provided in **Part 4, Appendix D-4**.

The City has continuously implemented its Water Waste Prevention Ordinance over the last five years.

8.1.2. Metering

The City meters all customer connections, including separate metering for single-family residential, commercial, industrial, and landscape customers. Furthermore, if there is new development within the City, each facility is individually metered. Service charges for the City are based on the customers' connection size. Further information regarding the City's service fees and conservation pricing is provided in **Section 8.1.3**.

The City has continuously metered all connections over the last five years.

8.1.3. Conservation Pricing

The City's current water rates structure is tiered based on the cost of service, which typically promotes water conservation. Domestic and irrigation customers are billed on separate inclining block rate structures, with a fixed service charge based on meter size. The rate structures include three tiers.

8.1.4. Public Education and Outreach

The City offers public information programs for customers to promote water conservation. The City provides marketing and outreach materials to its customers by using social media platforms, the City's website, community outreach events, quarterly newsletters, school education programs, and direct communication to customers regarding their water use. Customers learn about rebates and additional programs through the City's website (the website available at this link).

The City conducts water conservation school education programs to Pomona elementary schools. Programs include school assemblies and lesson materials to educate students on the topics of water conservation. The City was no longer a member of the Water Education Water Awareness Committee (WEWAC) as of 2021. The City joined as a member in 2022 through TVMWD of the Public Water Agencies Group (PWAG) and active participation of the Communications and Education Team (CET) that promotes the education of water issues to local schools, including the Pomona Unified School District, essay contests to student and provides financial support for lesson plan materials to teachers, field trips about water, , and through the MWD program promotes the "Water is Life" art poster contest each year. The City will continue the school education programs to promote water conservation.

The City provides public information programs to promote and educate customers on water conservation by hosting and participating in City and regional community events, providing bill inserts, and attending community meetings. Events include the Drinking Water Week, Imagine a Day Without Water, Storm Water Awareness Week, Wyland National Mayor's Challenge for Water Conservation, Wyland Bus Mobile Learning experience, Fix a Leak Week, San Antonio Watershed Clean Up, National Night Out, Earth Day, the Chalk Art Festival, Concert in the Park, City Movie Night, and Public Works Day. All outreach event flyers, rebate information, and general conservation program information are provided at City Hall, senior centers, social media, and on the City's website. The City will continue these programs to promote water conservation.

Over the last five years, the City has continuously implemented public education and outreach activities.

8.1.5. Programs to Assess and Manage Distribution System Real Losses

The City's system is comprised mainly of single-family and multi-family dwellings. The City's losses range approximately from 4 to 12%, as discussed in **Section 2.1.3**. The City has water conservation literature that alerts customers to be on the lookout for water system leaks and to correct them promptly. The City is available to assist customers in answering questions regarding leaks or higher than expected water usage. The City also offers a "Water Watcher Reporting Line" both online and via a phone number for residents to report visible leaks or excess runoff.

The City in 2021, began a new program to assist with outreach to residential customers called WaterView Software which aligns with SB606 and AB1668. The program is tailored for efficiency and allocation compliance, it tracks commercial, industrial, and institutional (CII) sectors water usage trends, manages high users, and identifies specific land classifications for rebating. The water conservation team utilizes the system to reach out to high users, and to monitor compliance.

The City prepares annual water loss audits (discussed in **Section 2.1.3**) to monitor water losses. City staff review the audits to track real and apparent losses. Losses are monitored by comparing water production to sales. The City regularly monitors its system and repairs leaks in a timely manner. To help in its effort to reduce and eliminate losses, the City has purchased various sound correlators for identifying system leaks. In areas where a leak is visible, staff is dispatched to pinpoint the leak, minimize the excavation area, and save resources. The City will continue these programs to assess and manage distribution system real losses.

Over the last five years, the City has continuously implemented the activities described here each year.

8.1.6. Water Conservation Program Coordination and Staffing Support

The City's Environmental Program Division of the Water Resources Department employs a full-time Environmental Compliance Supervisor, Water Conservation Specialist, and one part-time Technical Specialist for water conservation program coordination. Water conservation program staff are responsible for the following:

- Compiling and submitting the SAFER reports, Water Loss Audit, and Annual Urban Water Use Objective and Water Use Report.
- Answering the Water Watcher 24-Hour Reporting Line.
- Sending letters to residents and businesses not complying with water conservation standards.
- Creating outreach materials and the quarterly newsletter.
- Staffing outreach table at City events.
- Attending all CalWEP, MWD, TVMWD Coordinators, WaterSense, Water Use Efficiency, CET, and PWAG meetings
- Distributing program and scholarship information to school district, teachers, and principals.
- Organizing various conservation events.

- Creating social media posts.

The City will continue to provide water conservation program coordination and staffing support.

8.1.7. Other Demand Management Measures

8.1.7.1. MWD's Residential Landscape Transformation Program

In addition to the above DMMs, the City implements its own programs and collaborates with regional partners such as MWD. The City participates in MWD's Residential Landscape Transformation Program to reward customers whose landscape designs utilize water-saving plants, technology, irrigation systems, and hardware. Incentives are presented on the City's website (the website is available at this link).

Since 2022, the city has conducted 253 residential landscape transformations which include an evaluation, sprinkler tunes ups, weather-based irrigation controls for front and back yards. The program has been very successful.

The City has continuously implemented this program over the last five years.

8.1.7.2. Rebate Programs

Through TVMWD, the City participates in MWD's regional rebate program, the SoCal WaterSmart Program, which is available to the City's residential and commercial customers. There are residential rebates available for the purchase of high-efficiency clothes washing (HECW) machines, premium high-efficiency toilets (PHET), weather-based irrigation controllers (Smart Controllers), rain barrels, rain cisterns, and turf removal to promote water conservation. Some measures, including PHETs, Smart Controllers, and turf removal, are also available to commercial customers. The City's commercial customers are additionally offered plumbing, landscaping, HVAC, and medical and dental equipment rebates. The City provides information about this program to customers on its website.

This program has been continuously in effect for the last five years.

8.1.7.3. U.S. Environmental Protection Agency's (USEPA) WaterSense



WaterSense, sponsored by the USEPA, is a great partnership program that simplifies water conservation. It serves as both a label for water-efficient products and a valuable resource for water-saving tips. The WaterSense label provides consumers with an easy way to identify water-efficient products, new homes, and programs that meet the EPA's rigorous criteria for efficiency and performance. These labeled products use at least 20% less water while performing on par with or even better than standard models. In addition, WaterSense collaborates with landscape irrigation professionals certified by labeled programs, emphasizing water efficiency.

Over the last five years, the City has provided information about this program to customers on its website.

8.1.7.4. Water Conservation Kits

The City's Water Resources Department offers residents a free, personalized water conservation kit. Customers can choose easy-to-install, water-saving devices, making a difference by saving water and lowering their monthly water bill in the process.

This program has been continuously in effect for the last five years.

9. Adoption, Submittal, and Implementation

This section describes the City's process for adopting, submitting, and implementing the 2025 RUWMP and WSCP.

9.1. Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2025 UWMPs are part of the 2025 RUWMP to all cities and counties and other stakeholders within the region that that 2025 RUWMP is being prepared. This notice was sent at least 60 days prior to the City's public hearing. The recipients are identified in **Part 1 Chapter 1** of the 2025 RUWMP and include all cities and counties within the City's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

The City provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4, Appendix D-2**.

9.2. Public Hearing and Adoption

The City held a public hearing on **May 18, 2026** to hear public comments and consider adopting this 2025 RUWMP and the City's WSCP. As part of the public hearing, the City provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2025 RUWMP took place before the adoption of the Plan, which allowed the City the opportunity to modify the 2025 RUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

The City's adoption resolution for the 2025 RUWMP and the City's WSCP is included in **Part 4, Appendix D-3.**

9.3. Plan Submittal

The City will submit the 2025 RUWMP and the City's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2025 RUWMP submittal to DWR will be done electronically through DWR's "Water Use Efficiency (WUE) Data Portal" website. The complete set of DWR Submittal Tables for the City is included in **Part 4, Appendix D-5**.

9.4. Public Availability

Within 30 days of submitting its Plan to DWR, the City will make the 2025 RUWMP and the City's WSCP available for public review. Copies will be accessible during normal business hours at the City Clerk's Office in City Hall and posted on the City's website for public viewing.

9.5. Amending an Adopted UWMP or WSCP

If the adopted 2025 RUWMP or the City's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 2: Local Agency Urban Water Management Plans

FINAL

2025 RUWMP

JUNE 2026

Part 2 Chapter 5: GSWC - Claremont 2025 Urban Water Management Plan



Golden State Water Company
A Subsidiary of American States Water Company

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Appendices

Part 4 of the 2025 RUMWP **Appendix E** contains Agency Supporting Information.

Acronyms and Abbreviations

Acronym	Description
AB1668	Assembly Bill 1668
AF	Acre-feet
AFY	acre-feet per year
AWWA	American Water Works Association
CII	commercial, industrial, and institutional
CPUC	California Public Utilities Commission
CRA	Colorado River Aqueduct
CWC	California Water Code
CWOL	Making Conservation a California Way of Life Regulation
DCP	Drought Contingency Plan
DMMs	demand management measures
DRA	Drought Risk Assessment
DWR	Department of Water Resources
DYYP	Dry-Year Yield Program
FY	Fiscal Year
GHGs	greenhouse gas
GIS	geographic information systems
GPCD	gallons per capita per day
GPM	Gallons Per Minute
gpmd	gallons per mile of pipe per day
gpscd	gallons per service connection per day
GRIP	Groundwater Reliability Improvement Program
GSWC	Golden State Water Company Claremont System
HECW	high-efficiency clothes washing
HVAC	Heating, Ventilation, and Air Conditioning
IEUA	Inland Empire Utilities Agency
kWh	kilowatt-hours
LACSD	Los Angeles County Sanitation District
MAF	million acre-feet
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
PFAS	Per- and polyfluoroalkyl substances
PHET	premium high-efficiency toilets
PWRP	Pomona Water Reclamation Plant
RHNA	Regional Housing Needs Assessment
RUWMP	Regional Urban Water Management Plan
SB X7-7	Senate Bill 7 of Special Extended Session 7
SB606	Senate Bill 606
SBX7-7	Senate Bill 7 of Special Extended Session 7

SCAG	Southern California Association of Governments
SWP	State Water Project
TVMWD	Three Valleys Municipal Water District
U.S.	U.S. Census Bureau
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
UWUO	urban water use objective
VOCs	volatile organic compounds
WECWC	West End Consolidated Water Company
WRMP	Water Resources Master Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water Savings Incentive Program
WUE	Water Use Efficiency
WWTP	Wastewater Treatment Plant

Individual UWMP

This chapter describes information specific to the Golden State Water Company (GSWC) Claremont System, including its supplies, demands, and water use efficiency programs. The information and analysis provided in this chapter supplements the regional information presented in **Part 1 of the 2025 Regional Urban Water Management Plan (RUWMP)** and is provided to fulfill the GSWC Claremont's reporting requirements for 2025 under the UWMP Act.

The regional analyses described in Part 1 (Regional Context) of the 2025 RUWMP were conducted using a consistent analytical framework, assumptions, and methodologies that are directly applicable to GSWC Claremont. GSWC Claremont relies on Part 1 of the RUWMP for the lay description, regional water supply availability, and the underlying technical methodology used to evaluate water supply reliability under normal, single dry-year, multiple dry-year, and five-year drought stress-test conditions.

The water supply reliability assessment and Drought Risk Assessment (DRA) applicable to GSWC Claremont's Urban Water Management Plan (UWMP) are presented in plain language in Part 1 of the 2025 RUWMP, specifically within Chapter 5.

Building upon that regional foundation, the supply and demand comparisons specific to GSWC Claremont are presented in the tables within this UWMP. Unless otherwise noted, the conclusions of the regional water supply reliability assessment and DRA are directly applicable to GSWC Claremont and satisfy the requirements of the Urban Water Management Planning Act and the 2025 UWMP Guidebook. A completed DWR UWMP Compliance Checklist for GSWC is provided in **Part 4, Appendix E-1**.

1. System Description

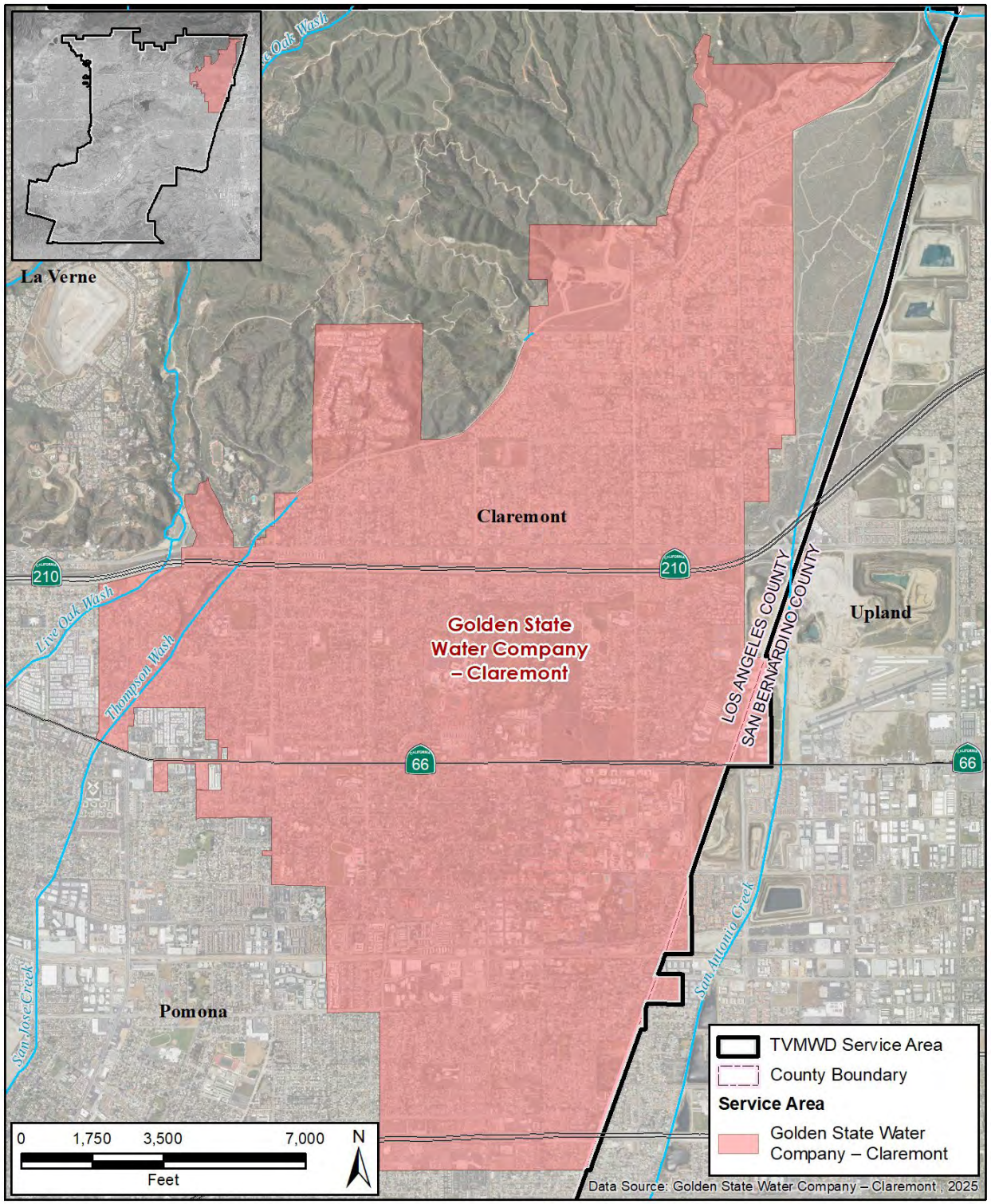
This section describes the GSWC Claremont System's water system, service area, population demographics, local climate, and land uses.

GSWC is a regulated public water utility that provides potable water service to customers in the City of Claremont, portions of the Cities of Montclair, Pomona, and Upland, and adjacent unincorporated areas of Los Angeles County. GSWC's service area encompasses an area of approximately 9.2 square miles and is located in the easterly portion of Los Angeles County and southerly of the San Gabriel Mountains. GSWC's service area is generally bordered by the Los Angeles County line to the east, the City of La Verne to the west, and the City of Pomona to the south. The GSWC Claremont System's service area is shown in **Figure 1-1**.

As a regulated utility, GSWC's water rates, service obligations, and capital improvement investments are overseen and approved by the California Public Utilities Commission through a formal process. This regulatory framework ensures that customers receive reliable, safe drinking water at reasonable rates while allowing the utility to recover costs associated with operating, maintaining, and upgrading water supply and distribution infrastructure.

GSWC obtains its water supply from local groundwater (from Six Basins and Chino Basin) and treated imported water from the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD), as well as treated water from City of Upland.

Figure 1-1. Service Area



1.1. Service Area

GSWC is a retail public water supplier that meets the definition of an urban water supplier with 11,491 municipal water service connections in 2024. The regional climate, which includes the GSWC Claremont System's service area, is described in **Part 1 Chapter 2** of the 2025 RUWMP.

1.1.1. Population, Demographics, and Socioeconomics

Estimates of population served by the GSWC are based on the 2020 U.S. Census Bureau and the Southern California Association of Governments (SCAG) (Southern California Association of Governments, 2024). A geographic information systems (GIS) analysis of 2020 Census data was used to determine the GSWC's 2020 service area population, which was 39,169. The 2020 population and the number of residential connections served by the GSWC in 2020 were used to derive a 2020 persons per residential connection factor of 3.5. This factor was then multiplied by the GSWC's number of residential connections in 2025 to estimate the 2025 population served by the GSWC. To project the population served by the GSWC from 2030 to 2050, average annual population growth rates from SCAG projections were applied to this 2025 estimate. A GIS analysis of SCAG projection data was used to determine the SCAG growth rate specific to the GSWC's service area. SCAG projected an increase in population from 2019 to 2035 averaging 0.26% per year and from 2035 to 2050 averaging -0.02% per year. Estimated current and projected populations of the GSWC's service area are included in **Table 1-1**.

Table 1-1. Current and Projected Population

Population Served	2025	2030	2035	2040	2045	2050
Total	40,637	41,169	41,702	41,687	41,671	41,656

The estimated 2025 and projected future number of households and employees within the service area were estimated using the same approach as population. SCAG projected an increase in households from 2019 to 2035 averaging 0.54% per year and from 2035 to 2050 averaging 0.12% per year. SCAG projected an increase in employment from 2019 to 2035 averaging 0.16% per year and from 2035 to 2050 averaging 0.05% per year.

Table 1-2. SCAG Household and Employment Projections for Water Service Area

Category	2025	2030	2035	2040	2045	2050
Households	13,329	13,770	14,211	14,342	14,473	14,604
Employees	21,253	21,496	21,739	21,788	21,837	21,866

According to U.S. Census Bureau QuickFacts from 2024, the median household income in the GSWC is $125,647. The GSWC's poverty rate is 7%. The GSWC is 49% white alone, 14% Asian alone, 7% black alone, 18% two or more races, and 28% Hispanic or Latino. The average commute to work for workers at least 16 years of age is 27 minutes, which indicates that most jobs are local (United States Census Bureau, 2024). According to 2024 U.S. Census Bureau QuickFacts, GSWC's population is made up of 19% of seniors (65 years and over), 16% of persons under 18 years, and 3% of persons under 5 years. (United States Census Bureau, 2024). **Table 1-2** provides employment and household projections for the GSWC's water service area based on SCAG GIS data intersected with the water service area.

1.1.2. Land Use

Per the Fiscal Year (FY) 2024-2025 Three Valleys Municipal Water District Assessed Service Area by Land Use, GSWC Claremont System's land use distribution by parcel count is as follows:

- Single-Family Residential: 83%
- Multi-Family Residential and Condominiums: 11%
- Mobile Homes: <1%
- Commercial: 3%
- Churches: <1%
- Industrial: 1%
- Recreational Camping Facilities: <1%
- Vacant Residential: 2%
- Vacant Non-Residential: 1%

2. Water Use

This section describes the current and projected water uses within the GSWC's service area.

2.1. Water Use by Sector

2.1.1. Water Use Sectors Listed in Water Code

Water suppliers are required to identify water uses, to the extent that records are available, for at least each of the water use sectors identified in CWC 10631(d) to assist in the water demand projections. Recycled water uses are described in **Section 4.5**.

GSWC serves the following water uses:

Single Family Residential

Single family residential customers are typically on a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.

Multi-Family Residential

Multi-family residential customers are typically multiple dwelling units within one building or several buildings within one complex.

Landscape Irrigation

GSWC tracks the water use for landscape irrigation.

Commercial/Institutional

GSWC tracks commercial and institutional customer water uses as one. Commercial customers typically provide or distribute a product or service and institutional water customers are typically public services, such as higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

Losses

Distribution system water losses are the water losses from the point of water entry to the distribution system to the delivery point to the customer's system. Water losses are discussed in **Section 2.1.3**.

The number of active connections is shown in Table 2-1.

Table 2-1. Calendar Year 2021-2025 Connections by Customer Class

Customer Class	2021	2022	2023	2024	2025
Residential – Single Family	10,066	10,093	10,127	10,166	10,176
Residential – Multi-Family	242	244	244	248	250
Landscape Irrigation	282	283	281	282	282
Institutional/Governmental	9	9	9	10	10
Commercial	782	790	793	785	822
Total	**11,381**	**11,419**	**11,454**	**11,491**	**11,540**

2.1.2. Past and Current Water Use

GSWC serves potable water for a variety of uses, as summarized in **Table 2-2**. Over the past five years, GSWC served an average of 7,063 AFY of potable water. In 2025, 63% of the total potable water deliveries were to residential customers (56% to single-family accounts and 7% to multi-family accounts). **Table 2-2** shows the annual volume of potable water used by each customer class for 2025. Recycled water uses are described in **Section 4.5.**

Table 2-2. DWR 4-1R Actual Demands for Water, 2025, AFY

Use Type	Potable or Non-Potable (*optional)*	2025 Volume
Single Family	Potable	4,767
Multi-Family	Potable	627
Commercial	Potable	2,430
Landscape	Potable	724
Distribution System Water Loss	Potable	424
	Total	**8,972**

2.1.3. Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. GSWC monitors its water loss and prepares an annual American Water Works Association (AWWA) Water Audit to estimate the volume of water loss. GSWC has submitted all required water loss audits to the State, as shown in **Table 2-3.** Copies of GSWC's recent AWWA Water Audits are provided in **Part 4, Appendix E-6**.

Table 2-3. DWR 4-5R Month Water Loss Audit Reporting

Public Water System ID # Reported in DWR Table 2-1R	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910024	2020	Yes
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes

DWR Notes:
2020 AWWA: Claremont, Golden State Water Company - Validated Water Audit, CY2020.xls
2021 AWWA: Claremont, Golden State Water Company - Validated Water Audit, CY2021.xls
2022 AWWA: Claremont, Golden State Water Company - CY2022 - Validated Water Audit.xlsx
2023 AWWA: GSWC Claremont - CY2023 Validated Audit.xlsx
2024 AWWA: GWSC Claremont - CY2024 Validated Audit.xlsx

CWC Section 10608.34 required the State Water Resources Control Board (State Board) to develop water loss performance standards for urban retail water suppliers to minimize water waste through system leaks. Water loss performance standards were developed through a rulemaking that became effective in 2023. Under the regulations, each supplier will be required to comply, by 2028, with an individualized volumetric water loss standard based on real loss, using the economic model developed by the State Board and the supplier's own unique data. Real loss is the physical loss of water from water distribution systems, as opposed to apparent losses, which are revenue losses due to meter inaccuracies, billing errors or unauthorized consumption. A supplier's baseline water loss is calculated as the average water loss from at least 3 of the 4 water loss audits from 2017 – 2020. The real water loss performance standard is based on gallons per service connection per day (gpscd), or gallons per mile of pipe per day (gpmd), depending on how the supplier reports real loss. Post-2028 compliance with volumetric water loss standards will be assessed every three years based on the average of the supplier's real loss from the preceding three years, with an allowed variation of 5 gallons per connection per day above the supplier's water loss standard. Apparent loss standards are equal to the baseline apparent loss and compliance is evaluated at the same time as compliance with the Real Water Loss Performance Standard.

Although the compliance period has not yet started, CWC Section 10631 (d)(3)(C) requires water suppliers to provide data in the UWMP to show whether the supplier met its State Board water loss performance standard.

Over the last five years, GSWC's water losses have ranged from 3% to 11% when calculated as the difference between billed consumption and total production. To project the water loss component of future demands, GSWC assumed future water losses will be approximately 8% of total customer water use. Calculated water losses are shown in **Table 2-4.**

Based on data released by the State on January 30, 2026, GSWC's baseline real water loss is 56.1 gpscd and the real water loss standard is 45.6 gpscd, and the apparent loss standard is the baseline of 4.9 gpscd. No reduction from the baseline is required to meet the water loss standard by 2028. As shown in **Table 2-5**, based on the most recent water loss audit from 2024, the supplier met the real water loss

performance standard. **Section 8.1.5** discusses GSWC's programs to assess and manage distribution system real loss.

Table 2-4. Calculated Water Loss

Water Loss	2021	2022	2023	2024	2025
Calculated Water Loss	465	304	264	389	424
% Water Loss	11%	3%	4%	5%	5%

Table 2-5. DWR 4-6R Progress Towards 2028 Water Loss Standard

Public System ID # Reported in Submittal Table 2-1R	Did the Water Board Calculate a Water Loss Standard for this Public System?	2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Standard	Number of Units	Volume of Total Real Water Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Real Water Loss per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Apparent Water Loss per Unit per Day
CA1910024	Yes	45.6	gpscd	11,531	276	21.4	4.9	gpscd	11,531	152	11.8

2.2. Projected Water Use

Various demand projection scenarios and conditions were considered for this UWMP. Historic demand trends and water use per connection for each connection type (single family residential, multifamily residential, commercial, etc.) were assessed along with expected growth rates to project demand through 2050. The major assumptions used to develop demand projections are listed below:

Baseline Water Use: A historic baseline period is used to approximate "normal" demand patterns representative of what is expected in the future given normal conditions for influential factors impacting demand, known as "demand drivers". A key demand driver is rainfall. Baseline years incorporate impacts of dry and wet years since demand typically fluctuates with rainfall due to the need for more irrigation in dry years and less in wet years. For this UWMP, a baseline period of 2022-2024 is used, which captures two wet years and one dry year. A baseline water use per connection was established for each connection type.

Growth Rate: Indoor residential usage is considered separately from outdoor usage since indoor use is associated with people in a housing unit and outdoor use is associated with the landscape of a housing unit. Therefore, the growth of indoor residential demand is projected to scale with SCAG-based population projections as described in **Section 1.1.1** and outdoor residential demand is projected to scale with SCAG's housing growth rates as described in **Section 1.1.1**. CII and Landscape connections were assumed to grow at the same rate of historic connection growth.

Water Loss: Losses range from 3% to 5%. The GSWC anticipates water losses will be 8% through 2050.

Total Projected Demand ("status quo"): For each connection type, the baseline water use per connection was multiplied by the projected future number of connections to estimate future water use by connection type. The water loss percent was applied to the subtotal of demand for all connection types to determine the total projected future demand. This represents a "status quo" future demand assuming demand patterns remain the same as the baseline period.

Ultimately, it was assumed that demands would follow a historic baseline trend, or "status quo" initially, but continued conservation efforts would cause demands to reduce over time toward the historically lowest gallons per capita per day (GPCD) experienced in the past four years, which was 150 GPCD in 2023. Therefore, an average of the two historic demand scenarios was used to plan for historic demand trends that account for assumed future conservation, as shown in **Figure 2-1**. **Table 2-6** presents the projected demand by customer type through 2050 for this UWMP.

Figure 2-1. Historical and Projected Demands

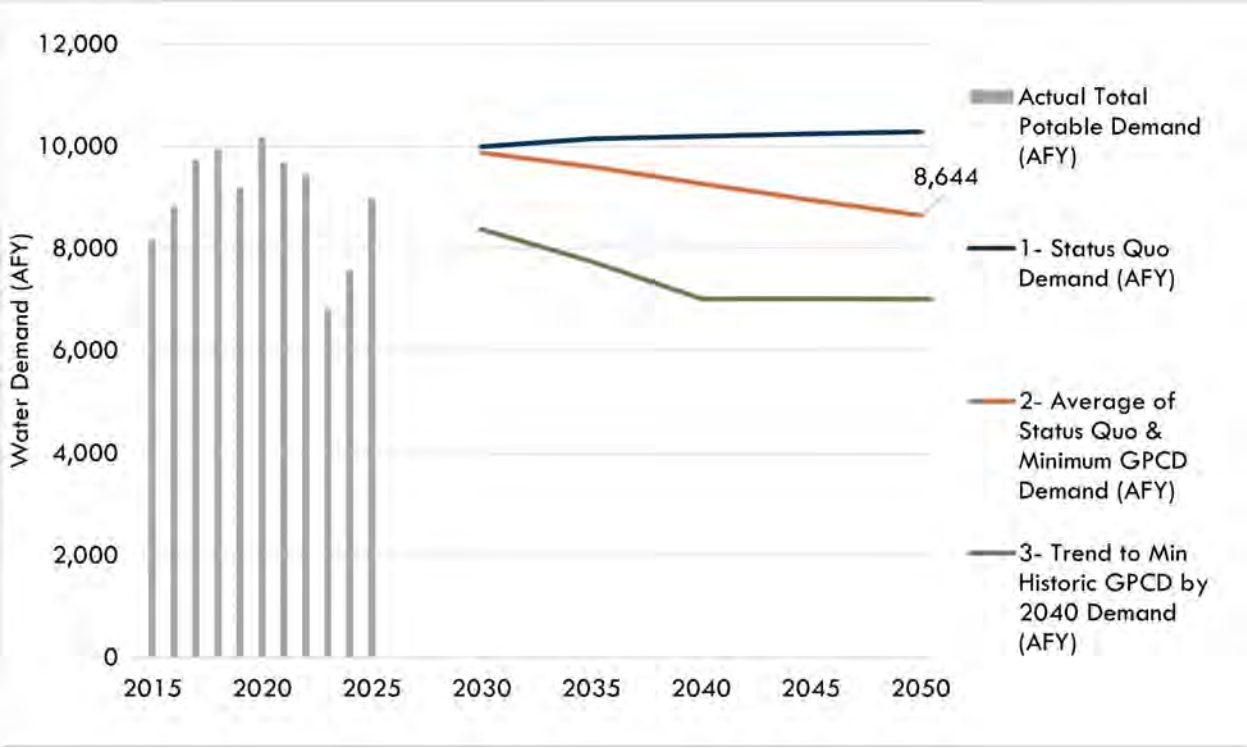


Table 2-6. DWR 4-2R Projected Demands for Water Use, AFY

Use Type	Additional Description	Level of Treatment When Delivered	Projected Water Use 2030	Projected Water Use 2035	Projected Water Use 2040	Projected Water Use 2045	Projected Water Use 2050
Single Family		Potable	5,302	5,157	4,974	4,802	4,642
Multi-Family		Potable	719	699	674	651	629
Commercial		Potable	2,645	2,572	2,481	2,395	2,315
Landscape		Potable	717	697	672	649	628
Distribution System Water Loss		Potable	491	477	460	444	430
		Total	**9,873**	**9,603**	**9,262**	**8,941**	**8,644**

Table 2-6 and **Table 2-7** satisfy the requirement to include anticipated water conservation savings when developing future demand projections for the next 25 years because they trend downward toward historically low GPCD, reflecting additional conservation savings in the future.

Senate Bill 1087 requires that water use projections in an UWMP include projected water use associated with single family and multi-family residential housing for lower income households, as identified in the housing elements of any city, county, or city and county within the supplier's service area. The Regional Housing Needs Assessment (RHNA) establishes housing needs for each jurisdiction over the applicable planning period. SCAG adopted the 6th Cycle RHNA Allocation Plan, which covers the planning period

from October 2021 through October 2029 (SCAG, March 2021). SCAG's population and household projections inform the RHNA Allocation Plan and are used in the determination and allocation of housing needs, including lower income housing, for individual jurisdictions. The growth projections in this UWMP are based on SCAG projections for the service area and therefore also incorporate the lower income housing projections. The projected demands in this UWMP represent water use from all future growth and are inclusive of water use for lower income households

Table 2-7. DWR 4-3R Inclusion in Water Use Projections

Question	Yes or No
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included in Projections?	Yes

2.3. Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. A recent Climate Change Vulnerability Assessment utilizing data from DWR and 20 global climate models suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** of the 2025 RUWMP includes an assessment of the potential impacts of climate change.

3. SB X7-7 Compliance & Future Water Use Efficiency Requirements

This section describes compliance with the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7). The section demonstrates compliance with the 2020 SBX7-7 target and discusses future water use efficiency requirements.

3.1. Compliance and Future Water Use Efficiency Requirements

SBX7-7 was incorporated into the UWMP Act in 2009 and required that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20 percent by the year 2020.

SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, March 2021) specify methodologies for determining the baseline water demand, 2015 interim urban water use target, and the 2020 urban water use target for GSWC as described in the 2020 UWMP. This section also demonstrates that GSWC achieved its 2020 water use target.

Table 3-1 below establishes GSWC's 2020 actual and 2020 target GPCD. As shown, GSWC met its 2020 target. Most recently, in 2025, the water use was 197 GPCD, which is well below the 2020 target of 265 GPCD.

Table 3-1. SB X7-7 2020 Target Progress

2020 Target GPCD	2020 Actual GPCD	Did Supplier Achieve Target?
265	247	Yes

New water use efficiency standards from the CWOL Regulation supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the "2018 Water Conservation Legislation." Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation, each urban retail water supplier must comply with its urban water use objective (UWUO). The UWUO is the sum of standards for indoor residential water; outdoor residential water use; commercial, industrial, and institutional (CII) landscape areas irrigated with dedicated meters; water losses; variances (if applicable); and bonus incentives for potable reuse (if applicable). DWR and the State Board have developed a reporting framework for calculating the UWUO and compliance annually with efficiency standards becoming increasingly stringent through 2040.

The demand projections in this UWMP plan for supply reliability if demands continue in alignment with historic patterns, but GSWC separately estimates its UWUO in order to plan and implement demand management measures (described in **Section 8**) to support meeting the UWUO. DMMs and UWUO

compliance planning enhance resiliency for drought and other water shortage conditions as described in **Sections 5, 7,** and **8**.

4. Water Supply

GSWC utilizes three primary sources for water supply: treated imported surface water purchased from MWD through TVMWD, treated water purchased from City of Upland, and groundwater pumped from the Chino Basin and Six Basins. More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2025 RUWMP.

4.1. Purchased or Imported Water

4.1.1. Three Valleys Municipal Water District

GSWC purchases treated imported water from MWD through TVMWD. MWD imports water from the Colorado River through the Colorado River Aqueduct (CRA), owned and operated by MWD, and the State Water Project (SWP), which utilizes the CRA for transmission to Southern California. Water delivered to TVMWD's member agencies can receive treated imported water from MWD's Weymouth Treatment Plant located in the City of La Verne or from TVMWD's Miramar Water Treatment Plant located in the City of Claremont.

GSWC's treated imported water supplies from MWD, through TVMWD, may be impacted during a multi-year drought or other conditions which limits MWD from delivering sufficient water supplies to all its member agencies, and consequently to GSWC. A description of this supply and its reliability is provided in **Part 1 Chapter 3** and **Chapter 5** of the 2025 RUWMP**.**

4.1.2. City of Upland

GSWC purchases treated water from the City of Upland. GSWC has an interconnection with the City of Upland that provides for water exchanges between the two agencies. This interconnection is at Claremont Avenue and 6th Street within GSWC's service area with an estimated capacity of 1,500 GPM. While this interconnection provides operational flexibility and emergency redundancy, GSWC-Claremont does not rely on it for baseload supply. As such, historical and projected normal-year deliveries from this source are 0 AF.

4.2. Groundwater

GSWC can extract groundwater from two regional groundwater basins: Six Basins and Chino Basin. Both basins have been adjudicated and are managed for long-term sustainability, as discussed further in **Part 1, Chapter 3** of the 2025 RUWMP**.**

4.2.1. Six Basins

GSWC produces groundwater from Six Basins. Six Basins is a group of six interconnected groundwater basins that underlie areas of the Cities of Claremont, La Verne, Pomona, and Upland, and surrounding

unincorporated areas of Los Angeles and San Bernardino Counties. GSWC currently produces groundwater from 12 wells located in Six Basins.

As detailed in **Part 1, Section 3.2.3**, the Six Basins are adjudicated and managed by the Six Basins Watermaster. GSWC pumps from the Canyon, Upper Claremont Heights, Lower Claremont Heights, and Pomona Basins (collectively referred to as the "Four Basins"), which are subject to an Operating Safe Yield (OSY) determined annually by the Watermaster.

GSWC's percent share of the OSY is 34.741 percent for use of groundwater in the Four Basins. In addition, GSWC has historically secured rights under long-term lease from the City of Claremont (2.77%) and Pomona College (1.85%). According to the Six Basins Watermaster Annual Report for Calendar Year 2024, with these leases included, GSWC's total available groundwater right in the Six Basins is 39.36% of the OSY. GSWC also has additional groundwater rights through ownership in West End Consolidated Water Company (WECWC). **Table 4-1** quantifies GSWC's total combined pumping allocation rights in the Six Basins over the last five years.

Table 4-1. GSWC Total Six Basins Pumping Allocation (AF)

Calendar Year	Base OSY Share (34.74%)	Leased Share (4.62%)	Total Available Pumping Right (39.36%)
2021	4,516	601	5,117
2022	4,516	601	5,117
2023	4,516	601	5,117
2024	4,690	624	5,314
2025	4,864	647	5,511

4.2.2. Chino Basin

GSWC currently produces groundwater from the Chino Basin, which is a sub-basin of the Upper Santa Ana Valley Groundwater Basin and is managed by the Chino Basin Watermaster.

The Chino Basin Judgment originally established a Safe Yield for the Chino Basin of 140,000 AFY. Pursuant to the most recent Safe Yield reset effective in 2020, the Safe Yield in the Chino Basin is currently 131,000 AFY (July 1 to June 30). The Safe Yield is recalculated every 10 years and is defined in the Chino Basin Judgment as "the long-term average annual quantity of ground water (excluding replenishment of stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Chino Basin under conditions of a particular year without causing an undesirable result". The Chino Basin Judgment's allocation of the Safe Yield includes three separate Pools: (1) the "Overlying Agricultural Pool"; (2) the "Overlying Non-Agricultural Pool"; and (3) the "Appropriative Pool".

GSWC's percent share of the OSY is 0.75 percent. GSWC's available groundwater supply can be augmented by the annual reallocation of unpumped water from the Agricultural Pool to Appropriative Pool, which varies from year to year, as described in **Part 1, Section 3.2.2**. GSWC is also permitted to

extract groundwater in excess of its annual allocation and carryover rights, provided it pays a Replenishment Assessment to the Chino Basin Watermaster.

Table 4-2 summarizes GSWC's actual groundwater production over the past five years. Pumping volumes fluctuate annually based on total system demand, the availability of surface water, and local hydrological conditions.

Table 4-2. DWR 6-1R Groundwater Pumped Last Five Years (AF)

Groundwater Type	Location or Basin Name	2021	2022	2023	2024	2025
Alluvial Basin	Six Basins	4,143	4,150	3,286	2,908	3,389
Alluvial Basin	Chino Basin	1,073	1,065	921	990	938
	Total	**5,216**	**5,215**	**4,207**	**3,898**	**4,326**

4.3. Surface Water

GSWC does not directly use surface water to meet its water demands.

4.4. Stormwater

GSWC does not directly use stormwater to meet its water demands.

4.5. Wastewater and Recycled Water

Wastewater generated by GSWC is treated by Los Angeles County Sanitation District (LACSD). Wastewater is collected within GSWC's local sewer collection system. GSWC's local sewers tie into one of LACSD's regional trunk sewers. The regional trunk sewer lines deliver wastewater to Pomona Water Reclamation Plant (PWRP) and the A.K. Warren Water Resource Facility (formerly known as the Joint Water Pollution Control Plant); however, the percentage breakdown between these two plants in treating GSWC's wastewater is unknown. The water reclamation plants are not located within GSWC's service area.

To align with current conservation realities and CWOL framework, wastewater generation is estimated utilizing the State's 2025 indoor residential water use standard of 47 GPCD (as indoor water use serves as the direct proxy for wastewater generation). Based on GSWC's 2025 population of 40,637, the estimated amount of wastewater collected by GSWC is approximately 1.91 MGD (about 2,139 AFY). **Table 4-3** shows existing wastewater collection and treatment at LACSD.

GSWC does not have access to recycled water supplies due to the lack of infrastructure to convey recycled water to GSWC. Subject to availability of recycled water, GSWC would have to construct transmission and distribution facilities to deliver recycled water to customers within its service area.

4.5.1. Potential, Current, and Projected Recycled Water Uses

Currently, the wastewater collected from GSWC and treated at PWRP is used by recycled water customers that are not part of GSWC's service area boundaries.

Table 4-3. DWR 6-2R Wastewater Collected within Service Area in 2025 (AF)

Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Volume of Wastewater Collected from UWMP Service Area 2025**	**Name of Wastewater Treatment Plant (WWTP) and Place ID Number**	**Is WWTP Located Within UWMP Area?**
LACSD	Estimated	2,139	PWRP (Place ID 250700), A.K. Warren Water Resource Facility (Place ID 234156)	No
	Total	**2,139**		

4.6. Water Exchanges and Transfers

GSWC does not have any current or planned water exchange opportunities. However, TVMWD participates in MWD's Dry-Year Yield Program (DYYP). The DYYP is a groundwater storage and recovery program where supplemental water is stored in the Chino Basin during surplus years and could be recovered in-lieu of imported water from MWD through Inland Empire Utilities Agency (IEUA). The DYYP allows maximum use of imported water supplies available during wet years and stored groundwater in the Chino Basin during dry years. The DYYP can store up to 100,000 AF with maximum replenishment of 25,000 AFY and maximum extraction of 33,000 AFY. Based on the Chino Basin Watermaster 2024/2025 Assessment Package, during FY 2023-2024, there was 45,908.2 AF within the DYYP account. The agreement that authorized the DYYP will expire in 2028.

As described in **Part 1, Section 3.2.3**, water rights under the Six Basins Judgment can be transferred by assignment, sale, contract, or lease so long as such transfers meet the requirements of the Judgment. GWSC is able to utilize these transfer opportunities available for Six Basins water when necessary.

4.7. Future Water Projects

While the current water supply portfolio is sufficient to meet existing and projected demands, GSWC has identified improvement projects that will help maintain water system reliability as facilities age and as localized demand patterns shift.

GSWC has identified several planned projects that will support long-term water supply reliability for the Claremont System. These projects are outlined in GSWC's 2022 Claremont Master Plan, where each project is assigned a unique identification number and prioritized as short-term, mid-term, or long-term. The planned improvements include water quality enhancement projects, plant facility upgrades, and pipeline replacements, all informed by condition assessments performed by GSWC Operations and Planning staff.

In addition to internal capital projects, GSWC participated in the development of regional supply initiatives through the TVMWD Water Resources Master Plan (WRMP) and Drought Contingency Plan (DCP). Four regional water supply projects were identified in the WRMP and DCP effort through collaboration with TVMWD, member agencies, and regional stakeholders. These regional projects, described in **Part 1, Chapter 3**, are intended to enhance overall supply reliability for the region.

- Project 1: External Partnership with Covina Valley Water Company – Main Basin
- Project 2: TVMWD Groundwater Reliability Improvement Program (GRIP)
- Project 3: TVMWD Storing Water in Main San Gabriel Basin (GRIP+)
- Project 4: TVMWD–Pomona Chino Basin Conjunctive Use Exchange

As development continues within the service area and future demands increase, GSWC will continue evaluating and implementing additional projects that support water supply reliability, operational efficiency, and long-term system resilience.

4.8. Summary of Existing and Planned Sources of Water

GSWC's water supply is comprised of treated imported water, local surface water, and groundwater. The volume of water utilized from each source in 2025 is shown in **Table 4-4** and projected supply is shown in **Table 4-5**.

Table 4-4. DWR 6-8R Actual Water Supplies in 2025 (AF)

Water Supply	Additional Detail on Water Supply	2025 Actual Volume	2025 Potable or Non-Potable (optional)	2025 Total Entitlement (optional)
Groundwater (not desalinated)	Chino Basin	938	Potable	
Groundwater (not desalinated)	Six Basins	3,389	Potable	
Purchased or Imported Water	City of Upland	0	Potable	
Purchased or Imported Water	Metropolitan Water District – TVMWD	4,645	Potable	
	Total	**8,972**		

Supply Projection Methodology

To project future water supplies accurately and conservatively, GSWC, in coordination with TVMWD, evaluated supply projection methodologies. Rather than projecting supplies based on maximum legal entitlements or absolute physical extraction capacity, GSWC opted to utilize a "Real Water" (Utilization-Based) approach. This approach grounds future projections in empirical operational reality. The methodology utilized a baseline representing GSWC's average local supply utilization over the most recent five-year period (2021–2025), which was 8,635 acre-feet per year (AFY). This baseline smoothed out historically dry years (e.g., 2021) and historically wet years (e.g., 2023).

To calculate the projected supplies shown in **Table 4-5**, the following steps were applied:

1. **Climate Change Adjustments:** Specific climate change vulnerability factors, derived from TVMWD' 2024 Climate Vulnerability Analysis, were applied to the 2021-2025 baseline local agency supplies (Chino Basin groundwater and Six Basins groundwater) to forecast anticipated local yields through 2050.
2. **Imported Water Reliance:** The projected local supplies were then compared against GSWC's projected demand. Any projected unmet demand is assumed to be fulfilled by imported water purchases from TVMWD.

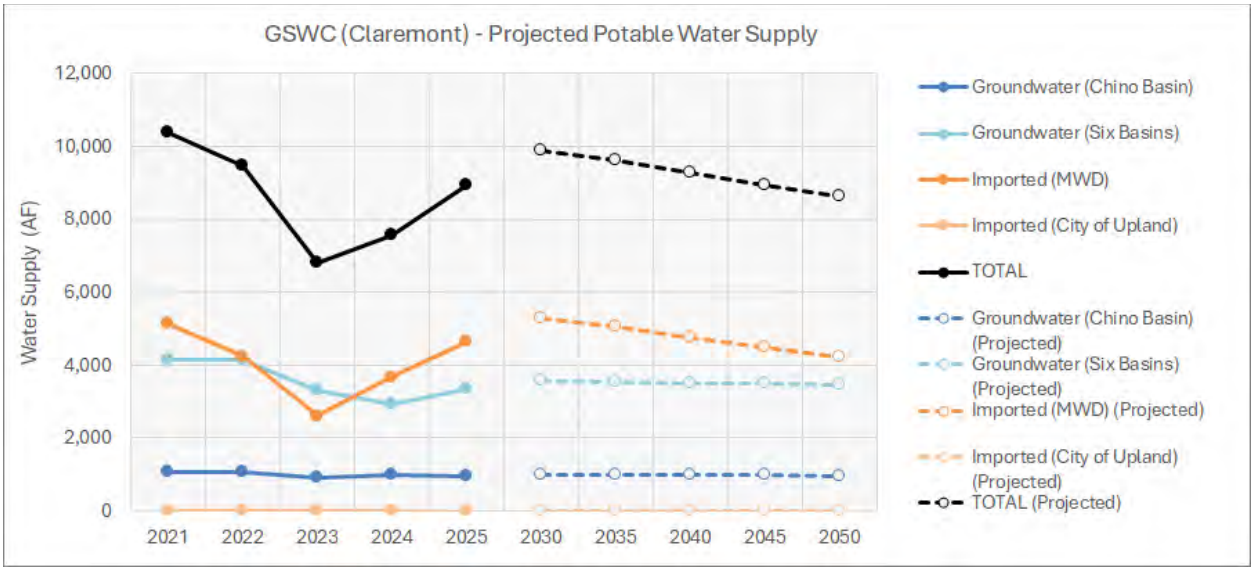
As shown in **Table 4-5** and **Figure 4-1**, GSWC's reliance on local groundwater from the Six Basins and Chino Basin is projected to decrease slightly over time under a climate change planning scenario that models potential impacts to local hydrology. Under this specific scenario, imported water purchases from TVMWD are projected to increase modestly to balance GSWC's overall supply portfolio and meet customer demands. It is important to note that these projections are intended for long-term

vulnerability planning purposes only; they do not incorporate future adaptation or mitigation strategies currently being developed or implemented at the regional level. Future actions, such as those identified in the DCP, are specifically designed to reduce or offset these potential climate-related impacts to local groundwater supplies. (Note: While GSWC maintains an interconnection with the City of Upland for operational flexibility and emergency redundancy, it is not relied upon for baseload supply; therefore, projected normal-year volumes from this source are 0 AF).

Table 4-5. DWR 6-9R Projected Water Supplies (AF)

Water Supply	Additional Detail on Water Supply	2030	2035	2040	2045	2050
Groundwater (not desalinated)	Chino Basin	1,003	990	981	973	965
Groundwater (not desalinated)	Six Basins	3,590	3,544	3,511	3,483	3,454
Purchased or Imported Water	Metropolitan Water District – TVMWD	5,280	5,069	4,769	4,485	4,224
Purchased or Imported Water	City of Upland	0	0	0	0	0
	Total	**9,873**	**9,603**	**9,262**	**8,941**	**8,644**

Figure 4-1. GSWC Projected Supply and Demand Comparison (AF)



4.9. Energy Intensity of Water Supplies

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.

- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2025, GSWC consumed 666.54 kWh of energy for water facilities per AF of water delivered.

5. Water Service Reliability Assessment

This section considers GSWC's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from GSWC's current source of supply through 2050.

5.1. Constraints on Water Sources

While GSWC maintains a highly reliable water portfolio, its supply sources are subject to various environmental, regulatory, and infrastructural constraints. A comprehensive analysis of regional water supply constraints is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of this RUWMP.

For GSWC – Claremont System specifically, the primary constraints on water sources include:

- **SWP-Dependent Infrastructure:** Due to pipeline elevations and regional network hydraulics, portions of the GSWC service area are situated within a "SWP-Dependent Area." This means GSWC is served by the Rialto Pipeline and TVMWD's Miramar Water Treatment Plant, which cannot physically receive treated Colorado River water from the CRA and rely entirely on SWP flows. As detailed in **Part 1, Section 3.1.2**, MWD typically buffers SWP allocation cuts using regional storage and its Water Supply Allocation Plan (WSAP). However, during severe multi-year droughts, physical limitations in delivering stored water to the Rialto Pipeline can trigger localized shortages and emergency mandates (such as the 2022 SWP-Dependent Area Emergency Conservation Program). Consequently, during severe multi-year droughts when SWP allocations are drastically reduced by the State, GSWC relies more on its local groundwater reserves and its emergency interconnection with the City of Upland to offset imported water constraints.
- **Groundwater Quality:** Contaminants of Emerging Concern (CECs), such as PFAS, as well as legacy Volatile Organic Compounds (VOCs) and nitrates in the Six Basins and Chino Basin, can force GSWC to temporarily remove active extraction wells from service. To mitigate this constraint and maintain reliable local extraction capacity, GSWC actively monitors its wellfield and invests in long-term capital improvement projects as detailed in **Section 4.7**.
- **Basin Adjudication and Climate Change:** GSWC's local supply is heavily dependent on groundwater from the Six Basins and Chino Basin. Extractions from these basins are legally constrained by court judgments and managed via OSYs and Safe Yields determined by their respective Watermasters. As described in **Part 1, Section 2.5**, prolonged droughts and climate-driven volatility reduce natural basin recharge. This can result in lowered OSY determinations. While paying assessments to purchase imported replacement water for extractions exceeding OSY is a standard component of normal basin operations, chronically lowered OSYs force GSWC to rely more heavily on this mechanism, particularly when the availability of imported replacement water required by the Watermasters may already be more constrained (and, therefore, more expensive), such as during severe multi-year droughts.

5.2. Year Type Characterization

In general, groundwater is less vulnerable to seasonal and climatic changes than surface water (i.e. local and imported) supplies. The Six Basins and Chino Basin Watermasters monitor groundwater levels and implement supplemental recharge programs to maintain the long-term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1, Chapter 3** of the 2025 RUWMP.

Because GSWC's baseline years are a mix of different hydrologic conditions, it is important to note how their supply strategy adapts to dry years. GSWC's primary groundwater supplies, the Six Basins and the Chino Basin, have variable OSYs that may decline during dry periods. However, under the respective adjudication frameworks for these basins, GSWC can legally and physically continue to produce the water it needs to meet elevated dry-year demands by paying replacement or replenishment water assessments for any production that exceeds its rights. As a result, GSWC's operational supply strategy is not significantly different in dry years compared to normal years. The changes in GSWC's projected baseline supply over time are primarily driven by long-term climate change factors (as detailed in **Section 4.8**) and planned infrastructure projects.

Per UWMP requirements, GSWC has evaluated reliability for an average year, single dry year, and a five consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** The single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** The driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

To characterize these year types, GSWC evaluated historical supply and demand data. For the purposes of this 2025 UWMP, GSWC established a "Normal Year" baseline using the average annual supply and demand from 2021 through 2025.

Because water demand typically increases during dry years due to elevated outdoor irrigation needs, the "Single Dry Year" and "Five-Year Drought" scenarios are modeled using historical years where production peaked to meet elevated drought demands. **Table 5-1** summarizes the base years utilized for this analysis and the corresponding volume of water available/utilized as a percentage of the average year.

Table 5-1. DWR 7-1R Basis of Water Year Data

Year Type	Base Year (FY)	Volume Available (AF)	% of Average Supply
Average Year	2021-2025	8,635	100%
Single-Dry Year	2021	10,370	120%
Consecutive Dry Years 1st Year	2018	9,979	116%
Consecutive Dry Years 2nd Year	2019	9,214	107%
Consecutive Dry Years 3rd Year	2020	10,175	118%
Consecutive Dry Years 4th Year	2021	10,370	120%
Consecutive Dry Years 5th Year	2022	9,460	110%

5.3. Water Service Reliability

The results of the reliability assessment are summarized below.

As established in **Section 4.8**, GSWC utilized the "Real Water" (Utilization-Based) methodology to project its future supplies. Under this operational approach, GSWC projects its local groundwater supplies from the Six Basins and Chino Basin based on historical averages adjusted for anticipated climate change impacts. Any remaining unmet demand is fulfilled by purchasing imported water from TVMWD.

GSWC's projected "Normal Year" water demands over the next 25 years were developed using a demand-per-connection approach as discussed in **Section 4.8** and **Section 5.2**. This approach utilizes a baseline period of 2025 to approximate normal demand patterns, projects future connections based on SCAG growth rates and incorporates anticipated reductions due to passive conservation and compliance with the new "Making Conservation a California Way of Life" (CWOL) regulatory framework.

To estimate projected demands during drought conditions, the GSWC utilized a historical ratio methodology. Because water demand in Southern California typically increases during hot, dry periods due to elevated outdoor irrigation needs, GSWC analyzed the ratio of total water utilized during historical dry periods compared to a historical average year.

Based on GSWC's operational data, the historical average year baseline was established using the five-year period of FY 2021–2025 (averaging 8,635 AFY).

- **Single Dry Year Scaling:** The ratio of water utilized during the historical single dry year of FY 2021 (10,370 AF) to the historical average (8,635 AF) yielded a scaling factor of 120 percent. This **120%** factor was applied to the projected normal year demands to estimate GSWC's projected water demands during future single dry years.
- **Five-Year Drought Scaling:** To estimate demands during a five-consecutive-year drought, GSWC utilized the historical drought sequence from FY 2018 through FY 2022. The ratio of water utilized in each of these years (9,979 AF, 9,214 AF, 10,175 AF, 10,370 AF, and 9,460 AF, respectively) compared to the historical average yielded scaling factors of **116%, 107%, 118%, 120%, and 110%** for years one through five of the drought sequence, respectively. These factors were applied to the projected normal year demands to forecast future multi-year drought demands.

Because TVMWD and MWD have demonstrated 100% supply reliability to meet wholesale demands through 2050 (supported by MWD's 2025 UWMP supply reliability analysis (MWD, 2026)), GSWC's total supply is projected to perfectly meet its total projected demand across all hydrologic scenarios. Consequently, the difference between supply and demand in the tables below is zero, reflecting a fully reliable water portfolio through the 2050 planning horizon.

Table 5-2, **Table 5-3**, and **Table 5-4** summarize GSWC's projected water supplies and demands over the next 25 years in five-year increments. These tables demonstrate GSWC can reliably meet elevated water demands during normal years, single dry years, and five-consecutive-year drought periods over the next 25 years.

Table 5-2. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	9,873	9,603	9,262	8,941	8,644
Demand totals	9,873	9,603	9,262	8,941	8,644
Difference	0	0	0	0	0

Table 5-3. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	11,857	11,533	11,123	10,738	10,381
Demand totals	11,857	11,533	11,123	10,738	10,381
Difference	0	0	0	0	0

Table 5-4. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

Year	Totals	2030	2035	2040	2045	2050
First Year	Supply Totals	11,410	11,098	10,704	10,333	9,990
	Demand Totals	11,410	11,098	10,704	10,333	9,990
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	10,536	10,247	9,884	9,541	9,224
	Demand Totals	10,536	10,247	9,884	9,541	9,224
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	11,634	11,316	10,914	10,536	10,186
	Demand Totals	11,634	11,316	10,914	10,536	10,186
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	11,857	11,533	11,123	10,738	10,381
	Demand Totals	11,857	11,533	11,123	10,738	10,381
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	10,817	10,521	10,148	9,796	9,471
	Demand Totals	10,817	10,521	10,148	9,796	9,471
	Difference	**0**	**0**	**0**	**0**	**0**

6. Drought Risk Assessment

The Drought Risk Assessment (DRA) is an analysis required for the 2025 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2026. While Section 5 evaluated long-term reliability through 2050, the DRA serves as an immediate stress test, focusing specifically on the five-year period from 2026 through 2030. The purpose of this assessment is to determine if GSWC anticipates any supply shortages in the immediate future that would necessitate triggering mandatory demand reduction measures outlined in the Water Shortage Contingency Plan.

6.1. Data, Methods, and Basis for Water Shortage Conditions

To conduct the DRA, GSWC utilized the same "Real Water" supply methodology and historical drought scaling factors detailed in **Section 4.8** and **Section 5**. The assessment simulates a severe, five-consecutive-year drought mirroring the hydrology of Fiscal Years 2018 through 2022.

Because hot, dry weather drives increases in outdoor irrigation, GSWC's unconstrained demands are projected to scale up significantly during this period (up to 120% of average baseline demand, as established in **Section 5.3**). The DRA tests whether GSWC's local groundwater and imported water portfolios can sustain these elevated demands over the next five years without natural replenishment.

6.2. DRA Water Source Reliability

GSWC's near-term reliability is highly secure due to the active management of the Six Basins and Chino Basin, and the unprecedented storage reserves held by its wholesale providers.

Entering the 2026–2030 DRA period, MWD holds nearly 4 million acre-feet (MAF) of water in regional storage, which is a near-record high. MWD's 2025 UWMP DRA modeling confirms that even if the SWP and CRA experience five consecutive years of severe constraint, MWD has sufficient stored reserves to meet all wholesale member agency demands without shortage allocations through 2030. Consequently, TVMWD can reliably supply GSWC with imported water to cover any deficits caused by constrained local groundwater production.

6.3. Total Water Supply and Use Comparison

Table 6-1 details the DRA for the 2026–2030 period. As demonstrated in the table, GSWC's projected supplies are sufficient to fully and consistently meet the elevated, unconstrained demands for every year of the five-year drought sequence.

Because GSWC anticipates a supply surplus (a difference of zero) across all five years of the near-term drought scenario, GSWC does not currently project a need to implement mandatory, extraordinary conservation measures or trigger advanced stages of its WSCP due to supply shortages. However, GSWC remains committed to ongoing water conservation and will continue to enforce standard water waste prohibitions to preserve regional storage.

Table 6-1. DWR 7-5 Five-Year Drought Risk Assessment (AF)

Category	2026	2027	2028	2029	2030
Total Water Use (Demand)	11,410	10,536	11,634	11,857	10,817
Total Supplies	11,410	10,536	11,634	11,857	10,817
Surplus/Shortfall without WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP – Supply Augmentation Benefit	0	0	0	0	0
WSCP – Use Reduction Savings Benefit	0	0	0	0	0
Revised Surplus/(Shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP Action	**0%**	**0%**	**0%**	**0%**	**0%**

7. Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) is a strategic plan developed by GSWC to proactively manage and respond to both anticipated and unforeseen water shortages. A water shortage is defined as a condition in which available water supplies are inadequate to meet expected customer demand at a specific point in time. Such shortages may result from various factors, including but not limited to, water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demand.

GSWC's WSCP is a detailed approach which presents how GSWC intends to act, or respond, in the case of an actual water shortage. It outlines a process for conducting annual water supply and demand assessments and establishes clearly defined stages and response measures to respond to actual conditions. This level of preparedness enhances transparency, ensures accountability, and GSWC's ability to maintain reliable water service during periods of supply disruption.

The WSCP was prepared in conjunction with the 2025 RUWMP and is presented as a standalone document that may be updated as necessary. No substantive changes have been incorporated into the 2025 WSCP compared to the 2020 version. Minor editorial updates were made for clarity and consistency; however, the content, procedures, and response actions remain relatively unchanged.

The GSWC's WSCP is included in **Part 4, Appendix E-7**.

8. Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that GSWC has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. GSWC met the 2025 Water Use Target through the implementation of these DMMs. GSWC expects to continue to implement current conservation programs to encourage conservation and achieve its water use targets.

8.1. Existing Demand Management Measures

8.1.1. Water Waste Prevention Ordinances

GSWC supports local agencies and cities in efforts to adopt ordinances which will reduce water waste. Such ordinances include the City of Claremont's Ordinances No. 2009-10 and No. 2010-02, pertaining to regulations on water conservation. GSWC also implements CPUC-approved rules including Rule 14.1 ("Water Conservation and Reduction Plan"), Schedule No. 14.1 ("Water Shortage Contingency Plan With Staged Mandatory Restrictions, Reductions And Drought Surcharges"), Schedule 14.1-CM ("Staged Mandatory Conservation and Rationing"), and Rule No. 20 ("Water Conservation), which prohibit water waste. Copies of these ordinances and the CPUC documents are provided in **Part 4, Appendix E-4**.

The City of Claremont adopted Ordinance No. 2009-10 ("Water Conservation and Water Supply Shortage Program and Regulations") in July 2009 to reduce water consumption by establishing water use restrictions including limitations on watering hours, watering duration, excessive runoff, washing down of hard surfaces, excessive pipeline leaks, and washing vehicles. Ordinance No. 2010-02 was adopted in March 2010 to establish water efficient landscape regulations and includes provisions for water management and water waste prevention for existing landscapes.

GSWC's Rule 14.1, when in effect, sets forth the procedures to implement the following water conservation restrictions:

- Use of potable water for non-essential or unauthorized purposes, as defined by State law or local ordinances, is prohibited.
- Failure to repair leaks or system malfunctions within 48 hours of notification by the utility may result in service termination, unless alternate arrangements are approved by the utility.
- Outdoor irrigation that causes runoff onto adjacent properties, non-irrigated areas, sidewalks, streets, parking areas, or structures is prohibited.
- Washing vehicles with potable water is prohibited unless a hose with an automatic shut-off nozzle is used.
- Use of potable water to wash buildings or hard surfaces (e.g., sidewalks, patios, courts) is prohibited except when required to protect public health or safety.

- Use of potable water for street washing is prohibited, except for initial construction wash-down when street sweeping is not feasible or for public health and safety purposes.
- Use of potable water in decorative fountains or water features is prohibited unless the system recirculates water.
- Irrigation of non-functional turf at commercial, industrial, or institutional sites using potable water is prohibited.
- Outdoor watering during prohibited hours or within 48 hours after measurable rainfall (0.1 inches or more) is prohibited.
- Use of potable water to irrigate ornamental turf on public street medians is prohibited.

Schedule 14.1-CM, when activated, imposes the mandatory conservation restrictions above and/or declares a level of water shortage which allows customer surcharges and reductions in water use (as discussed in the WSCP, provided in **Part 4, Appendix E-7**). The most current Schedule 14.1-CM was activated in 2021 and deactivated in 2023.

CPUC's Rule No. 20 discourages wasteful use of water and promotes the use of water saving devices. The stated purpose of the rule is to "ensure that water resources available to the utility are put to a reasonable beneficial use and that the benefits of the utility's water supply and service extend to the largest number of persons."

GSWC's most recent adoptions for Water Waste Prevention Ordinances are as shown:

Effective Dates:
Rule 14.1 - November 3, 2022
Schedule 14.1 - June 26, 2022
Rule 20 - February 2, 2015

8.1.2. Metering

GSWC meters all customer connections, including separate metering for single-family residential, commercial, industrial, and landscape customers. Furthermore, if there is new development within GSWC, each facility is individually metered. Service charges for GSWC are based on the customers' connection size. Further information regarding GSWC's service fees and conservation pricing is provided in **Section 8.1.3**.

GSWC has continuously metered all connections over the last five years.

8.1.3. Conservation Pricing

Beginning September 1, 2009, GSWC implemented a tiered conservation pricing rate structure for residential customers as approved by the CPUC. GSWC's current water rate structure is tiered to promote water conservation by customers. Single family residential customers are billed on an inclining block rate structure, with a fixed service charge based on meter size to encourage water conservation

and discourage waste. The rate structure includes three tiers. GSWC also has an inclining drought emergency surcharge pursuant to Schedule 14.1-CM ("Staged Mandatory Conservation and Rationing") when activated upon CPUC approval.

GSWC has continuously implemented conservation pricing for customer billing in accordance with its current rate schedule over the last five years.

8.1.4. Public Education and Outreach

GSWC offers public information programs for its customers. GSWC provides marketing and outreach materials to its customers by issuing press releases, publishing quarterly newsletters, using door tags, and sending bill inserts. Customers learn about rebates and additional programs through GSWC's website.

GSWC promotes water conservation through brochures, posters, activity booklets, public outreach displays, oral presentations, and workshops to inform the public. GSWC also raises awareness through paid advertising, press releases, news ads, media events, and through the Speaker's Bureau.

GSWC regularly conducts water conservation school education programs through the Discovery Science Center for Claremont elementary schools with an annual budget approved by CPUC. Students can receive a free conservation kit that includes a water survey and water saving devices. Results from the program are tracked annually in a comprehensive Program Summary Report which shows the estimated reduction in water usage achieved and the percentage of students who participated in the program. GSWC has been offering other school education programs since September 1992 to raise awareness of water issues including Water Awareness Art Contests, Water Education Grant Program, Water Resource Library, and much more.

GSWC is a United States Environmental Protection Agency (USEPA) WaterSense Partner and sponsors community events including Earth Day, Fix-a-Leak Week, and Water Awareness Months to encourage conservation and water efficiency. GSWC also plans to sponsor community workshops that educate and assist customers on achieving water use efficiency in their landscapes and home through landscape planning, efficient irrigation concepts, and proper turf reduction or removal.

Over the last five years, GSWC has continuously implemented public education and outreach activities.

8.1.5. Programs to Assess and Manage Distribution System Real Losses

GSWC's system is comprised mainly of single and multi-family dwellings. GSWC's water system losses range approximately from 3% to 11% percent, as discussed in **Section 2.1.3**. GSWC has water conservation literature that alerts customers to be on the lookout for irrigation leaks and to correct them promptly. GSWC is available to assist customers in answering questions regarding leaks or higher than expected water usage.

GSWC's Water Loss Control Program is used to prepare the annual water loss audits and monitor water losses. GSWC's Operations Engineering Department reviews the audits to track real and apparent losses.

Losses are monitored by comparing water production to sales. In addition, the Operations Engineer contracts with leak detection companies to perform a survey if necessary. If the annual water loss audit indicates water losses exceed water system goals, a full leak survey will be performed to identify water loss sources and impacts on the overall water system. Leak locations and work orders for repairs are also documented and processed for future water loss control actions. GSWC will continue these programs to assess and manage distribution system real losses.

Over the last five years, GSWC has continuously implemented the activities described here each year.

8.1.6. Water Conservation Program Coordination and Staffing Support

GSWC maintains a fully staffed water conservation department including the Vice President of Environmental Quality, a Water Use Efficiency Manager, and a Senior Water Efficiency Program Specialist. GSWC also utilizes consultants to support program development and implementation on an as-needed basis. GSWC plans to continue to provide water conservation program coordination and staffing support.

8.1.7. Other Demand Management Measures

GSWC implements additional DMM programs using both GSWC-only programs and programs in collaboration with regional partners. Additional information is discussed below and provided in GSWC's *Claremont Customer Service Area Rebates and Programs*, which is available at this link.

GSWC provides an audit program for high-use single-family and multi-family residential customers. These customers are identified through billing data and then contacted to offer free audits. Audits are also offered to walk-in customers at the local customer service area office.

GSWC participates in MWD's regional rebate program, the SoCal WaterSmart Program which is available to the GSWC's residential and commercial customers. There are residential rebates available for the purchase of high-efficiency clothes washing (HECW) machines, premium high-efficiency toilets (PHET), weather-based irrigation controllers (Smart Controllers), rain barrels, rain cisterns, and turf removal to promote water conservation. Some measures, including PHETs, Smart Controllers, and turf removal, are also available to commercial customers. GSWC's commercial customers are additionally offered plumbing, landscaping, HVAC, and medical and dental equipment rebates. GSWC provides information about these programs to customers on its website.

GSWC provides its customers with free high-efficiency conservation kits which include water savings devices and information. Kits include one (1) 1.5 GPM high efficiency showerhead, one (1) 1.5 GPM kitchen aerator, two (2) 1.0 GPM bath aerators, and leak detection tablets with instructions.

GSWC's large landscape program consists of identifying and contacting high-use customers, providing information and offering water use surveys, voluntary landscape water use budgets, and landscape training. The program is available to all large landscape customers free of charge.

Through the Water Savings Incentive Program (WSIP), GSWC customers are provided financial incentives for customized water efficiency projects such as the installation of commercial or industrial high-

efficiency equipment, industrial process improvements, agricultural and landscape water efficiency improvements, and water management services.

These programs have been continuously in effect for the last five years. GSWC plans to continue implementation of the programs described above to promote water conservation.

9. Adoption, Submittal, and Implementation

This section describes GSWC's process for adopting, submitting, and implementing the 2025 RUWMP and WSCP.

9.1. Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2025 UWMPs are part of the 2025 RUWMP to all cities and counties and other stakeholders within the region that that 2025 RUWMP is being prepared. This notice was sent at least 60 days prior to GSWC's public hearing. The recipients are identified in **Part 1 Chapter 1** of the 2025 RUWMP and include all cities and counties within GSWC's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

GSWC provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4, Appendix E-2**.

9.2. Public Hearing and Adoption

GSWC held a public hearing on **May 26, 2026** to hear public comments and consider adopting this 2025 RUWMP and GSWC's WSCP. As part of the public hearing, GSWC provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2025 RUWMP took place before the adoption of the Plan, which allowed GSWC the opportunity to modify the 2025 RUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

GSWC'S adoption resolution for the 2025 RUWMP and GSWC's WSCP is included in **Part 4, Appendix E-3.**

9.3. Plan Submittal

GSWC will submit the 2025 RUWMP and the GSWC's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2025 RUWMP submittal to DWR will be done electronically through DWR's "Water Use Efficiency (WUE) Data Portal" website. The complete set of DWR Submittal Tables for the GSWC Claremont System is included in **Part 4, Appendix E-5**.

9.4. Public Availability

Within 30 days of submitting its Plan to DWR, GSWC will make the 2025 RUWMP and GSWC's WSCP available for public review. Copies will be accessible during normal business hours at the GSWC customer service office and posted on GSWC's website for public viewing.

9.5. Notification to Public Utilities Commission

GSWC will submit the 2025 Plan (and WSCP) to the California Public Utilities Commission as part of its general rate case filings.

9.6. Amending an Adopted UWMP or WSCP

If the adopted 2025 RUWMP or GSWC's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

10. References

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 2: Local Agency Urban Water Management Plans

FINAL

2025 RUWMP

JUNE 2026

Part 2 Chapter 6: GSWC - San Dimas 2025 Urban Water Management Plan



Golden State Water Company
A Subsidiary of American States Water Company

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Appendices

Part 4, Appendix F of the 2025 RUMWP contains Agency Supporting Information.

Acronyms and Abbreviations

Acronym	Definition
AB1668	Assembly Bill 1668
AF	Acre-feet
AFY	acre-feet per year
AWWA	American Water Works Association
CIC	Covina Irrigating Company
CII	commercial, industrial, and institutional
CRA	Colorado River Aqueduct
CVWC	Covina Valley Water Company
CWC	California Water Code
CWOL	Making Conservation a California Way of Life Regulation
DCP	Drought Contingency Plan
DMMs	demand management measures
DRA	Drought Risk Assessment
DWR	Department of Water Resources
FY	Fiscal Year
GEI	GEI Consultants
GHGs	greenhouse gas
GIS	geographic information systems
GPCD	gallons per capita per day
GPM	Gallons Per Minute
GRIP	Groundwater Reliability Improvement Program
GRIP+	Groundwater Reliability Improvement Program (Plus)
GSP	Groundwater Sustainability Plan
GSWC	Golden State Water Company San Dimas System
HECW	high-efficiency clothes washing
HVAC	Heating, Ventilation, and Air Conditioning
kWh	kilowatt-hours
LACSD	Los Angeles County Sanitation District
MAF	million acre-feet
MGD	million gallons per day
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
PFAS	Per- and polyfluoroalkyl substances
PHET	premium high-efficiency toilets
RHNA	Regional Housing Needs Assessment
RUWMP	Regional Urban Water Management Plan
SB X7-7	Senate Bill 7 of Special Extended Session 7
SB606	Senate Bill 606
SBX7-7	Senate Bill 7 of Special Extended Session 7

SCAG	Southern California Association of Governments
SGMA	Sustainable Groundwater Management Act
SJCWRP	San Jose Creek Water Reclamation Plant
SWP	State Water Project
TVMWD	Three Valleys Municipal Water District
U.S.	U.S. Census Bureau
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
UWUO	urban water use objective
VHWC	Valencia Heights Water Company
VOCs	volatile organic compounds
WRMP	Water Resources Master Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water Savings Incentive Program
WUE	Water Use Efficiency

Individual UWMP

This chapter describes information specific to the Golden State Water Company (GSWC) San Dimas System, including its supplies, demands, and water use efficiency programs. The information and analysis provided in this chapter supplements the regional information presented in **Part 1 of the 2025 Regional Urban Water Management Plan (RUWMP)** and is provided to fulfill GSWC San Dimas System's reporting requirements for 2025 under the UWMP Act.

The regional analyses described in Part 1 (Regional Context) of the 2025 RUWMP were conducted using a consistent analytical framework, assumptions, and methodologies that are directly applicable to GSWC San Dimas. GSWC San Dimas relies on Part 1 of the RUWMP for the lay description, regional water supply availability, and the underlying technical methodology used to evaluate water supply reliability under normal, single dry-year, multiple dry-year, and five-year drought stress-test conditions.

The water supply reliability assessment and Drought Risk Assessment (DRA) applicable to GSWC San Dimas' Urban Water Management Plan (UWMP) are presented in plain language in Part 1 of the 2025 RUWMP, specifically within Chapter 5.

Building upon that regional foundation, the supply and demand comparisons specific to GSWC San Dimas are presented in the tables within this UWMP. Unless otherwise noted, the conclusions of the regional water supply reliability assessment and DRA are directly applicable to GSWC San Dimas and satisfy the requirements of the Urban Water Management Planning Act and the 2025 UWMP Guidebook. A completed DWR UWMP Compliance Checklist for the GSWC San Dimas System is provided in **Part 4, Appendix F-1**.

1. System Description

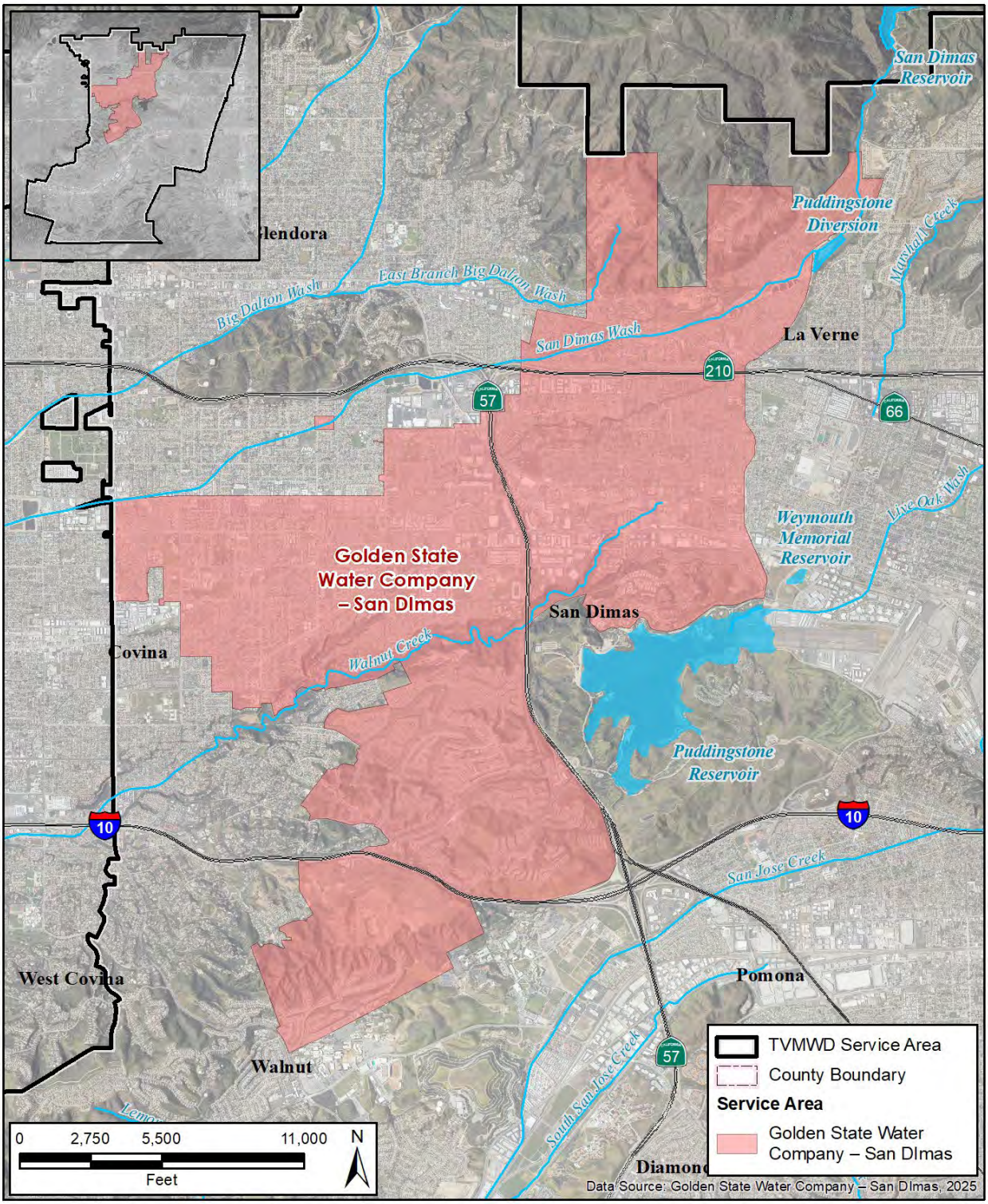
This section describes the GSWC's water system, service area, population demographics, local climate, and land uses.

GSWC provides water service to the City of San Dimas, portions of the Cities of La Verne, Walnut, and Covina, and adjacent unincorporated areas of Los Angeles County. GSWC's service area encompasses approximately 13.7 square miles and is located in the easterly portion of Los Angeles County and southerly of the San Gabriel Mountains. GSWC's service area is bordered by the City of La Verne to the east, the Cities of Covina and Glendora to the west, and the City of Pomona to the south. The GSWC's service area is shown in **Figure 1-1.**

As a regulated utility, GSWC's water rates, service obligations, and capital improvement investments are overseen and approved by the California Public Utilities Commission through a formal process. This regulatory framework ensures that customers receive reliable, safe drinking water at reasonable rates while allowing the utility to recover costs associated with operating, maintaining, and upgrading water supply and distribution infrastructure.

GSWC obtains local groundwater from the Main San Gabriel Basin and receives treated surface water from Covina Valley Water Company. To supplement these supplies, GSWC purchases treated imported water from the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD), as well as treated water from Walnut Valley Water District.

Figure 1-1. Service Area



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1.1. Service Area

The GSWC is a retail public water supplier that meets the definition of an urban water supplier with 16,363 municipal water service connections in 2024. The regional climate, which includes the GSWC's service area, is described in **Part 1 Chapter 2** of the 2025 RUWMP.

1.1.1. Population, Demographics, and Socioeconomics

Estimates of population served by the GSWC are based on the 2020 U.S. Census Bureau and the Southern California Association of Governments (SCAG) (Southern California Association of Governments, 2024). A geographic information systems (GIS) analysis of 2020 Census data was used to determine the GSWC's 2020 service area population, which was 56,351. The 2020 population and the number of residential connections served by the GSWC in 2020 were used to derive a 2020 persons per residential connection factor of 3.5. This factor was then multiplied by GSWC's number of residential connections in 2025 to estimate the 2025 population served by the GSWC. To project the population served by the GSWC from 2030 to 2050, average annual population growth rates from SCAG projections were applied to this 2025 estimate. A GIS analysis of SCAG projection data was used to determine the SCAG growth rate specific to the GSWC's service area. SCAG projected an increase in population from 2019 to 2035 averaging 0.93% per year and from 2035 to 2050 averaging 0.06% per year. Estimated current and projected populations of the GSWC's service area are included in **Table 1-1**.

Table 1-1. Current and Projected Population

Population Served	2025	2030	2035	2040	2045	2050
Total	57,511	60,156	62,802	62,992	63,181	63,370

According to 2024 U.S. Census Bureau QuickFacts, GSWC's population is made up of 20% of seniors (65 years and over), 20% of persons under 18 years, and 5% of persons under 5 years. (United States Census Bureau, 2024). **Table 1-2** provides employment and household projections for the GSWC's water service area based on SCAG GIS data intersected with the water service area.

The estimated 2025 and projected future number of households and employees within the service area were estimated using the same approach as population. SCAG projected an increase in households from 2019 to 2035 averaging 1.39% per year and from 2035 to 2050 averaging 0.16% per year. SCAG projected an increase in employment from 2019 to 2035 averaging 0.25% per year and from 2035 to 2050 averaging 0.03% per year. The estimated number of households and employees were determined by linear interpolation between SCAG projections for 2019, 2035, and 2050 as shown in **Table 1-2**.

Table 1-2. SCAG Household and Employment Projections for Water Service Area

Category	2025	2030	2035	2040	2045	2050
Households	20,373	21,760	23,148	23,332	23,516	23,700
Employees	25,312	25,625	25,938	25,975	26,013	26,050

According to U.S. Census Bureau QuickFacts from 2024, the median household income in the GSWC is $105,321. The GSWC's poverty rate is 10%. The GSWC is 40% white alone, 16% Asian alone, 3% black

alone, 24% two or more races, and 40% Hispanic or Latino. The average commute to work for workers at least 16 years of age is 31 minutes, which indicates that most jobs are local (United States Census Bureau, 2024). According to 2024 U.S. Census Bureau QuickFacts, GSWC's population is made up of 20% of seniors (65 years and over), 20% of persons under 18 years, and 5% of persons under 5 years. (United States Census Bureau, 2024). **Table 1-2** provides employment and household projections for the GSWC's water service area based on SCAG GIS data intersected with the water service area.

1.1.2. Land Use

Per the Fiscal Year (FY) 2024-2025 Three Valleys Municipal Water District Assessed Service Area by Land Use, the GSWC's land use distribution by parcel count is as follows:

- Single Family Residential: 84%
- Multi-Family Residential and Condominiums: 10%
- Mobile Homes: <1%
- Commercial: 3%
- Churches: <1%
- Industrial: 1%
- Vacant Residential: 2%
- Vacant Non-Residential: <1%

2. Water Use

This section describes the current and projected water uses within GSWC's service area.

2.1. Water Use by Sector

2.1.1. Water Use Sectors Listed in Water Code

Water suppliers are required to identify water uses, to the extent that records are available, for at least each of the water use sectors identified in CWC 10631(d) to assist in the water demand projections. Recycled water uses are described in **Section 4.5.**

GSWC serves the following water uses:

Single Family Residential

Single family residential customers are typically on a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.

Multi-Family Residential

Multi-family residential customers are typically multiple dwelling units within one building or several buildings within one complex.

Landscape Irrigation

GSWC tracks the water use for landscape irrigation.

Commercial/Institutional

GSWC tracks commercial and institutional customer water uses as one. Commercial customers typically provide or distribute a product or service and institutional water customers are typically public services, such as higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

Losses

Distribution system water losses are the water losses from the point of water entry to the distribution system to the delivery point to the customer's system. Water losses are discussed in **Section 2.1.3**.

The number of active connections are shown in **Table 2-1**.

Table 2-1. Calendar Year 2021-2025 Connections by Customer Class

Customer Class	2021	2022	2023	2024	2025
Residential – Single Family	14,814	14,831	14,857	14,860	14860
Residential – Multi-Family	252	255	256	260	267
Landscape Irrigation	111	112	112	112	116
Institutional/Governmental	1	1	1	1	1
Commercial	1,143	1,143	1,139	1,130	1129
Total	**16,321**	**16,342**	**16,365**	**16,363**	**16,373**

2.1.2. Past and Current Water Use

GSWC serves potable water for a variety of uses, as summarized in **Table 2-2**. Over the past four years, GSWC served an average of 9,098 AFY of potable water. In 2025, 66% of the total potable water deliveries were to residential customers (57% to single-family accounts and 9% to multi-family accounts). **Table 2-2** shows the annual volume of potable water used by each customer class for 2025. Recycled water uses are described in **Section 4.5.**

Table 2-2. DWR 4-1R Actual Demands for Water, 2025, AFY

Use Type	Potable or Non-Potable (*optional)*	2025 Volume
Single Family	Potable	5,382
Multi-Family	Potable	864
Commercial	Potable	2,555
Landscape	Potable	660
Distribution System Water Loss	Potable	753
	Total	**10,214**

2.1.3. Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. GSWC monitors its water loss and prepares an annual American Water Works Association (AWWA) Water Audit to estimate the volume of water loss. GSWC has submitted all required water loss audits to the State, as shown in **Table 2-3**. Copies of the GSWC's recent AWWA audits are provided in **Part 4, Appendix F-6**.

Table 2-3. DWR 4-5R Month Water Loss Audit Reporting

Public Water System ID # Reported in DWR Table 2-1R	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910142	2020	Yes
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes

DWR Notes:

2020 AWWA: San Dimas, Golden State Water Company - Validated Water Audit, CY2020.xls
2021 AWWA: San Dimas, Golden State Water Company - Validated Water Audit, CY2021.xls
2022 AWWA: GSWC San Dimas - CY2022 Validated Audit.xlsx
2023 AWWA: GSWC San Dimas - CY2023 Validated Audit.xlsx
2024 AWWA: GWSC San Dimas - CY2024 Validated Audit.xlsx

CWC Section 10608.34 required the State Water Resources Control Board (State Board) to develop water loss performance standards for urban retail water suppliers to minimize water waste through system leaks. Water loss performance standards were developed through a rulemaking that became effective in 2023. Under the regulations, each supplier will be required to comply, by 2028, with an individualized volumetric water loss standard based on real loss, using the economic model developed by the State Board and the supplier's own unique data. Real loss is the physical loss of water from water distribution systems, as opposed to apparent losses, which are revenue losses due to meter inaccuracies, billing errors or unauthorized consumption. A supplier's baseline water loss is calculated as the average water loss from at least 3 of the 4 water loss audits from 2017 – 2020. The real water loss performance standard is based on gallons per service connection per day (gpscd), or gallons per mile of pipe per day (gpmd), depending on how the supplier reports real loss. Post-2028 compliance with volumetric water loss standards will be assessed every three years based on the average of the supplier's real loss from the preceding three years, with an allowed variation of 5 gallons per connection per day above the supplier's water loss standard. Apparent loss standards are equal to the baseline apparent loss and compliance is evaluated at the same time as compliance with the Real Water Loss Performance Standard.

Although the compliance period has not yet started, CWC Section 10631 (d)(3)(C) requires water suppliers to provide data in the UWMP to show whether the supplier met its State Board water loss performance standard.

Over the last five years, GSWC's water losses have ranged from 4% to 9% when calculated as the difference between billed consumption and total production. To project the water loss component of future demands, GSWC assumed future water losses will be approximately 4% of total customer water use. Calculated water losses are shown in **Table 2-4.**

Based on data released by the State on January 30, 2026, GSWC's baseline real water loss is 18.4 gpscd and the real water loss standard is 18.4 gpscd, and the apparent loss standard is the baseline of 11.3 gpscd. No reduction from the baseline is required to meet the water loss standard by 2028. As shown in **Table 2-5**, based on the most recent water loss audit from 2024, GSWC has not yet met the real water

loss performance standard, but is working toward that goal by 2028. **Section 8.1.5** discusses GSWC's programs to assess and manage distribution system real loss.

Table 2-4. Calculated Water Loss

Water Loss	2022	2023	2024	2025
Calculated Water Loss	386	548	825	753
% Water Loss	4%	6%	9%	7%

Table 2-5. DWR 4-6R Progress Towards 2028 Water Loss Standard

Public System ID # Reported in Submittal Table 2-1R	Did the Water Board Calculate a Water Loss Standard for this Public System?	2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Standard	Number of Units	Volume of Total Real Water Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Real Water Loss per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Apparent Water Loss per Unit per Day
CA1910142	Yes	18.4	gpscd	16,392	562	30.6	11.3	gpscd	16,392	171	9.4

2.2. Projected Water Use

Various demand projection scenarios and conditions were considered for this UWMP. Historic demand trends and water use per connection for each connection type (single family residential, multi-family residential, commercial, etc.) were assessed along with expected growth rates to project demand through 2050. The major assumptions used to develop demand projections are listed below:

Baseline Water Use: A historic baseline period is used to approximate "normal" demand patterns representative of what is expected in the future given normal conditions for influential factors impacting demand, known as "demand drivers". A key demand driver is rainfall. Baseline years incorporate impacts of dry and wet years since demand typically fluctuates with rainfall due to the need for more irrigation in dry years and less in wet years. For this UWMP, a baseline period of 2022-2024 is used, which captures two wet years and one dry year. Furthermore, 2022 was the second highest demand and 2023 was the lowest demand since the 2012-2016 drought, so this baseline period captures a wide range of demand drivers to approximate an average or normal demand pattern. A baseline water use per connection was established for each connection type.

Growth Rate: Indoor residential usage is considered separately from outdoor usage since indoor use is associated with people in a housing unit and outdoor use is associated with the landscape of a housing unit. Therefore, the growth of indoor residential demand is projected to scale with SCAG-based population projections as described in **Section 1.1.1** and outdoor residential demand is projected to scale with SCAG's housing growth rates as described in **Section 1.1.1**. CII connections were assumed to scale with SCAG's employee projections as described in **Section 1.1.1**. Landscape and other use type connections were assumed to grow at the same rate of historic connection growth.

Water Loss: As described in the previous section, losses range from 4% to 9%. The GSWC anticipates water losses will be 4% through 2050.

Total Projected Demand ("status quo"): For each connection type, the baseline water use per connection was multiplied by the projected future number of connections to estimate future water use by connection type. The water loss percent was applied to the subtotal of demand for all connection types to determine the total projected future demand. This represents a "status quo" future demand assuming demand patterns remain the same as the baseline period.

Ultimately, it was assumed that demands would follow a historic baseline trend, or "status quo" initially, but continued conservation efforts would cause demands to reduce over time toward the historically lowest gallons per capita per day (GPCD) experienced in the past four years, which was 137 GPCD in 2023. Therefore, an average of the two historic demand scenarios was used to plan for historic demand trends that account for assumed future conservation, as shown in **Figure 2-1**. **Table 2-6** presents the projected demand by customer type through 2050 for this UWMP.

Figure 2-1. Historic and Projected Demand

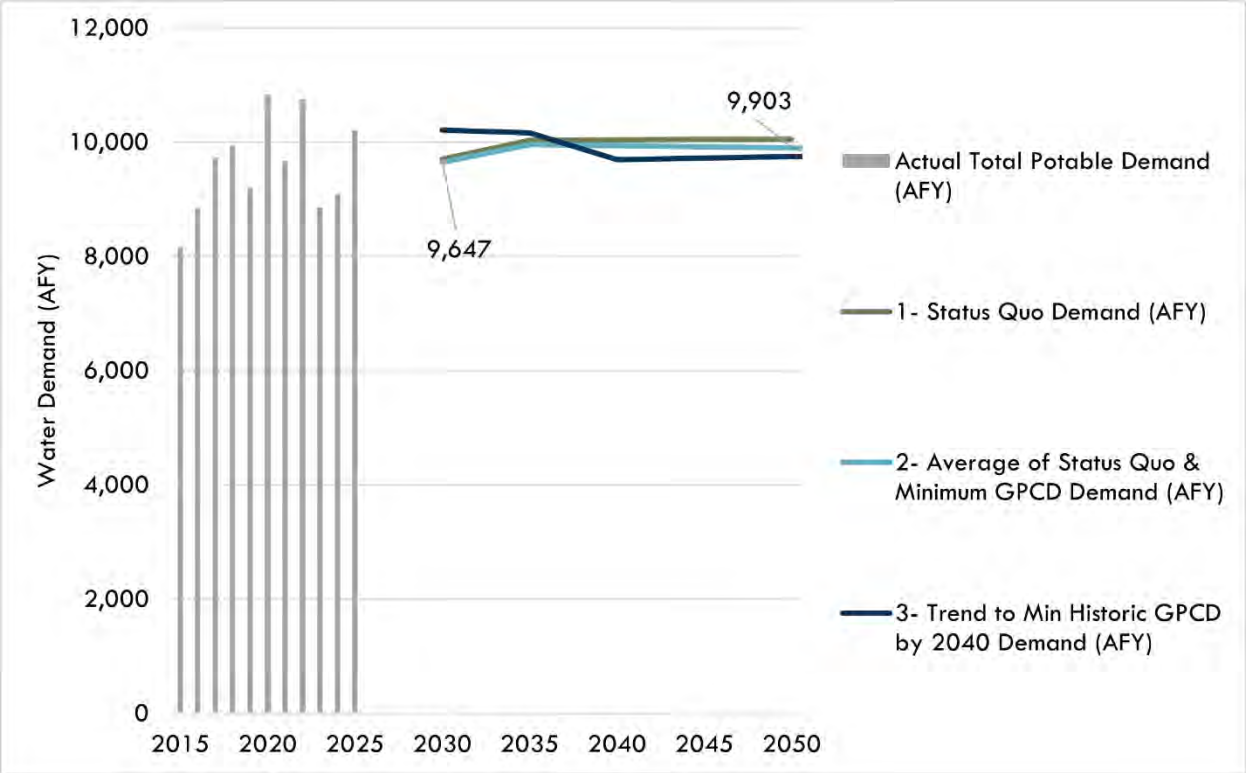


Table 2-6. DWR 4-2R Projected Demands for Water Use (AF)

Use Type	Additional Description	Level of Treatment When Delivered	Projected Water Use 2030	Projected Water Use 2035	Projected Water Use 2040	Projected Water Use 2045	Projected Water Use 2050
Single Family		Potable	5,365	5,582	5,549	5,515	5,480
Multi-Family		Potable	856	890	885	880	874
Commercial		Potable	2,550	2,578	2,578	2,579	2,579
Landscape		Potable	561	566	571	575	579
Distribution System Water Losses		Potable	380	383	387	389	392
Total			**9,713**	**10,000**	**9,970**	**9,937**	**9,903**

Table 2-6, and **Table 2-7** satisfy the requirement to include anticipated water conservation savings when developing future demand projections for the next 25 years because they trend downward toward historically low GPCD, reflecting additional conservation savings in the future.

Senate Bill 1087 requires that water use projections in an UWMP include projected water use associated with single family and multi family residential housing for lower income households, as identified in the housing elements of any city, county, or city and county within the supplier's service area. The Regional Housing Needs Assessment (RHNA) establishes housing needs for each jurisdiction over the applicable planning period. SCAG adopted the 6th Cycle RHNA Allocation Plan, which covers the planning period

from October 2021 through October 2029 SCAG, March 2021). SCAG's population and household projections inform the RHNA Allocation Plan and are used in the determination and allocation of housing needs, including lower income housing, for individual jurisdictions. The growth projections in this UWMP are based on SCAG projections for the service area and therefore also incorporate the lower income housing projections. The projected demands in this UWMP represent water use from all future growth and are inclusive of water use for lower income households.

Table 2-7. DWR 4-3R Total Gross Water Use (AF)

Question	Yes or No
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included in Projections?	Yes

2.3. Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. A recent Climate Change Vulnerability Assessment utilizing data from DWR and 20 global climate models suggests that a changing climate will have multiple effects on the Region. **Part 1 Chapter 2** of the 2025 RUWMP includes an assessment of the potential impacts of climate change.

3. SB X7-7 Compliance & Future Water Use Efficiency Requirements

This section describes compliance with the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7). The section demonstrates compliance with the 2020 SBX7-7 target and discusses future water use efficiency requirements.

3.1. Compliance and Future Water Use Efficiency Requirements

SBX7-7 was incorporated into the UWMP Act in 2009 and required that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20 percent by the year 2020.

SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, March 2021) specify methodologies for determining the baseline water demand, 2015 interim urban water use target and the 2020 urban water use target for GSWC as described in the 2020 UWMP. This section also demonstrates that GSWC achieved its 2020 water use target.

Table 3-1 below establishes GSWC's 2020 actual and 2020 target GPCD. As shown, GSWC met its 2020 target. Most recently, in 2025, the water use was 159 GPCD, which is well below the 2020 target of 182 GPCD.

Table 3-1. SB X7-7 2020 Target Progress

2020 Target GPCD	2020 Actual GPCD	Did Supplier Achieve Target?
192	182	Yes

New water use efficiency standards from the CWOL Regulation supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the "2018 Water Conservation Legislation." Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation, each urban retail water supplier must comply with its urban water use objective (UWUO). The UWUO is the sum of standards for indoor residential water; outdoor residential water use; commercial, industrial, and institutional (CII) landscape areas irrigated with dedicated meters; water losses; variances (if applicable); and bonus incentives for potable reuse (if applicable). DWR and the State Board have developed a reporting framework for calculating the UWUO and compliance annually with efficiency standards becoming increasingly stringent through 2040.

The demand projections in this UWMP plan for supply reliability if demands continue in alignment with historic patterns, but GSWC separately estimates its UWUO in order to plan and implement demand management measures (DMMs) (described in **Section 8**) to support meeting the UWUO. DMMs and

UWUO compliance planning enhance resiliency for drought and other water shortage conditions as described in **Sections 5, 7, and 8**.

4. Water Supply

GSWC primary sources for water supply include groundwater pumped from Main San Gabriel Basin (Main Basin), purchased water from Covina Valley Water Company (CVWC) and Walnut Valley Water District (WVWD), local surface water from San Dimas Canyon Creek, and treated imported water purchased from MWD through TVMWD. More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2025 RUWMP.

4.1. Purchased or Imported Water

4.1.1. Three Valleys Municipal Water District

GSWC purchases treated imported water from MWD through TVMWD. MWD imports water from the Colorado River through the Colorado River Aqueduct (CRA), owned and operated by MWD, and the State Water Project (SWP), which utilizes the CRA for transmission to Southern California. Water delivered to TVMWD's member agencies can receive treated imported water from MWD's Weymouth Treatment Plant located in the City of La Verne or from TVMWD's Miramar Water Treatment Plant located in the City of Claremont.

GSWC's treated imported water supplies from MWD, through TVMWD, may be impacted during a multi-year drought or other conditions which limit MWD from delivering sufficient water supplies to all its member agencies, and consequently to GSWC. A description of this supply and its reliability is provided in **Part 1 Chapter 3** and **Chapter 5** of the 2025 RUWMP.

4.1.2. Covina Valley Water Company

GSWC can purchase water supply from Covina Valley Water Company (CVWC). CVWC was formed through the merger of Covina Irrigating Company (CIC) and Valencia Heights Water Company (VHWC), effective in 2024. Although CIC and VHWC now operate under the combined CVWC organization, the operational facilities and water supplies previously attributed to CIC remain unchanged.

CVWC sources of supply include surface water diversions from the San Gabriel River, groundwater pumped from the Main San Gabriel Basin and untreated imported water. CVWC owns the Temple Plant, which is a surface water treatment plant located near the intersection of Arrow Highway and Grand Avenue in the City of Glendora, which is used to treat the local surface water and the imported water. The Temple Plant has a capacity of approximately 10 MGD. Treated water from CVWC is delivered to GSWC through a connection with a 960 AFY capacity. Through CVWC, GSWC can purchase treated surface water and groundwater. CVWC water supplies augment GSWC's sources of supply from the Main Basin and treated imported water.

4.1.3. Walnut Valley Water District

GSWC purchases treated water from WVWD. While the physical infrastructure – an interconnection with a design capacity of 1,500 GPM – provides emergency redundancy and operational flexibility, it is not strictly a standby connection. GSWC-San Dimas actively utilizes this interconnection to purchase water from WVWD to help meet baseload demands. Based on historical utilization and projected operational needs, GSWC anticipates purchasing approximately 210 AFY from WVWD under normal conditions through the 2050 planning horizon.

4.2. Groundwater

GSWC produces groundwater from the Main Basin. The Main Basin is a sub-basin of the San Gabriel Valley Basin. The Main Basin has been adjudicated and is managed for long-term sustainability; a detailed hydrogeological description of the Main Basin is provided in **Part 1 Chapter 3** of the RUWMP.

4.2.1. Main Basin

The Watermaster manages the basin through an Operating Safe Yield (OSY), which is determined annually based on groundwater elevations and rainfall. GSWC holds a prescriptive pumping right equal to 2.92105 percent of the declared OSY. GSWC manages its pumping in accordance with Watermaster rules; if GSWC's water demands require pumping in excess of its OSY share, GSWC pays a "Replacement Water" assessment to the Watermaster, which is used to purchase untreated imported water to artificially recharge the basin.

On May 1, 2024, Watermaster conducted a public hearing and approved Resolution No. 05-25-321 establishing the OSY at 160,000 acre-feet for FY 2024-25, 140,000 acre-feet for FY 2025-26, 140,000 acre-feet for FY 2026-27, 140,000 acre-feet for FY 2027-28, and 140,000 acre-feet for FY 2028-29.

Table 4-1 summarizes GSWC's actual groundwater production over the past five years. Pumping volumes fluctuate annually based on total system demand, the availability of surface water, and local hydrological conditions.

Table 4-1. DWR 6-1R Groundwater Pumped Last Five Years (AF)

Groundwater Type	Location or Basin Name	2021	2022	2023	2024	2025
Alluvial Basin	Main Basin	1,808	2,406	1,315	1,847	2,548
	Total	**1,808**	**2,406**	**1,315**	**1,847**	**2,548**

4.3. Surface Water

GSWC possesses SWRCB License 2329 to divert 500 AFY of untreated surface water from the San Dimas Canyon Creek. San Dimas Canyon Creek flows into San Dimas Dam and Reservoir. Based on the terms of the Main Basin Judgment (*Upper San Gabriel Valley MWD v. City of Alhambra*, Case No. 924128), surface water from the San Dimas Canyon Creek can either be diverted directly from the creek or allowed to percolate and be produced as groundwater within the Main Basin. GSWC is designated as an "Integrated

Producer" under Section 18 of the Judgment, which means their historical surface water and groundwater rights are aggregated into a single right. This allows GSWC the sole discretion to forego direct surface diversions from the creek and instead extract this 500 AFY as groundwater from the Main Basin in addition to its standard OSY pumping allocation without incurring a Replacement Water assessment.

Untreated surface water that is diverted from the San Dimas Canyon Creek can be used to meet non-potable demands, such as irrigation. However, GSWC has not diverted surface water from the San Dimas Canyon Creek since 2012 and does not anticipate diversions from the creek in the future. Consequently, historical baseline and projected normal-year supplies from local surface water are modeled as 0 AFY for the 2025 RUWMP.

4.4. Stormwater

GSWC does not directly use stormwater to meet its water demands.

4.5. Wastewater and Recycled Water

GSWC wastewater is collected by gravity sewers and lift stations owned by the Cities of San Dimas, Covina, La Verne, Walnut, and the Sanitation Districts of Los Angeles County (LACSD). Wastewater is transported through LACSD trunk sewers to LACSD's San Jose Creek Water Reclamation Plant (SJCWRP).

Wastewater is collected within GSWC's local sewer collection system. GSWC's local sewers tie into one of LACSD's regional trunk sewers. The regional trunk sewer lines deliver wastewater to one or more water reclamation plants owned by LACSD for treatment. The water reclamation plants are not located within GSWC's service area. The water reclamation plants serving GSWC include the SJCWRP and the A.K. Warren Water Resource Facility (formerly known as the Joint Water Pollution Control Plant). The percentage breakdown between these two plants in treating GSWC's wastewater is unknown. To align with current conservation realities and CWOL framework, wastewater generation is estimated utilizing the State's 2025 indoor residential water use standard of 47 GPCD (as indoor water use serves as the direct proxy for wastewater generation). Based on GSWC's 2025 population of 57,511, the estimated amount of wastewater collected by the City is approximately 2.70 MGD (about 3,028 AFY).

Table 4-2 shows existing wastewater collection and treatment at LACSD.

GSWC does not have access to recycled water supplies due to the lack of infrastructure to convey recycled water GSWC. Subject to availability of recycled water, GSWC would have to construct transmission and distribution facilities to deliver recycled water to customers within its service area.

4.5.1. Potential, Current, and Projected Recycled Water Uses

GSWC currently does not have a recycled water system. Although recycled water is used at Forest Lawn Memorial Park Cemetery located within GSWC's service area, recycled water is delivered from the California State Polytechnic University, Pomona campus, which receives recycled water from the LACSD Pomona Water Reclamation Plant via the City of Pomona Water Department.

GSWC and the City of San Dimas support the use of recycled water within GSWC and specifically encourage the construction of local wastewater reclamation plants so that recycled water can be used within GSWC.

There are no current, projected, or future projects that have been identified by GSWC with recycled use estimates.

Table 4-2. DWR 6-2R Wastewater Collected within Service Area in 2025 (AF)

Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Volume of Wastewater Collected from UWMP Service Area 2025**	**Name of Wastewater Treatment Plant (WWTP) and Place ID Number**	**Is WWTP Located Within UWMP Area?**
LACSD	Estimated	3,028	SJCWRP (Place ID 260156), A.K. Warren Water Resource Facility (Place ID 234156)	No
Total		**3,028**		

4.6. Water Exchanges and Transfers

GSWC does not have any current or planned water exchange opportunities. Water rights under the Main Basin Judgment are transferable by lease or purchase so long as such transfers meet the requirements of the Judgment. There is also provision for Cyclic Storage Agreements by which Parties and non-parties may store imported supplemental water in the Main Basin under such agreements with the Main Basin Watermaster pursuant to uniform rules and conditions and Court approval. GSWC can utilize the transfer opportunities available for Main Basin water when necessary. GSWC has historically transferred groundwater rights in the Main Basin between the San Dimas District and the San Gabriel District.

4.7. Future Water Projects

While the current water supply portfolio is sufficient to meet existing and projected demands, GSWC has identified improvement projects that will help maintain water system reliability as facilities age and as localized demand patterns shift.

GSWC has identified several planned projects that will support long-term water supply reliability for the San Dimas System. These projects are outlined in GSWC's 2022 San Dimas Master Plan, where each project is assigned a unique identification number and prioritized as short-term, mid-term, or long-term. The planned improvements include water quality enhancement projects, plant facility upgrades, and pipeline replacements, all informed by condition assessments performed by GSWC Operations and Planning staff.

In addition to internal capital projects, GSWC participated in the development of regional supply initiatives through the Three Valleys Municipal Water District Water Resources Master Plan (WRMP) and Drought Contingency Plan (DCP). Four regional water supply projects were identified in the WRMP and DCP effort through collaboration with TVMWD, member agencies, and regional stakeholders. These regional projects, described in **Part 1, Chapter 3**, are intended to enhance overall supply reliability for the region.

- Project 1: External Partnership with Covina Valley Water Company – Main Basin
- Project 2: TVMWD Groundwater Reliability Improvement Program (GRIP)
- Project 3: TVMWD Storing Water in Main San Gabriel Basin (GRIP+)
- Project 4: TVMWD–Pomona Chino Basin Conjunctive Use Exchange

As development continues within the service area and future demands increase, GSWC will continue evaluating and implementing additional projects that support water supply reliability, operational efficiency, and long-term system resilience.

4.8. Summary of Existing and Planned Sources of Water

GSWC's water supply is comprised of treated imported water and groundwater. The volume of water utilized from each source in 2025 is summarized in **Table 4-3** and projected supply is summarized in **Table 4-4**.

Table 4-3. DWR 6-8R Actual Water Supplies in 2025 (AF)

Water Supply	Additional Detail on Water Supply	2025 Actual Volume	2025 Potable or Non-Potable *(optional)*	2025 Total Entitlement *(optional)*
Groundwater (not desalinated)	Main Basin	2,548	Potable	
Purchased or Imported Water	Covina Valley Water Company	695	Potable	
Purchased or Imported Water	Metropolitan Water District	6,786	Potable	
Purchased or Imported Water	Walnut Valley Water District	185	Potable	
-	**Total**	**10,214**		-

Supply Projection Methodology

To project future water supplies accurately and conservatively, GSWC, in coordination with TVMWD, evaluated supply projection methodologies. Rather than projecting supplies based on maximum legal entitlements or absolute physical extraction capacity, GSWC opted to utilize a "Real Water" (Utilization-Based) approach. This approach grounds future projections in empirical operational reality. The methodology utilized a baseline representing GSWC's average local supply utilization over the most recent five-year period (2021–2025), which was 10,039 acre-feet per year (AFY). This baseline smoothed out historically dry years (e.g., 2021) and historically wet years (e.g., 2023).

To calculate the projected supplies shown in **Table 4-4**, the following steps were applied:

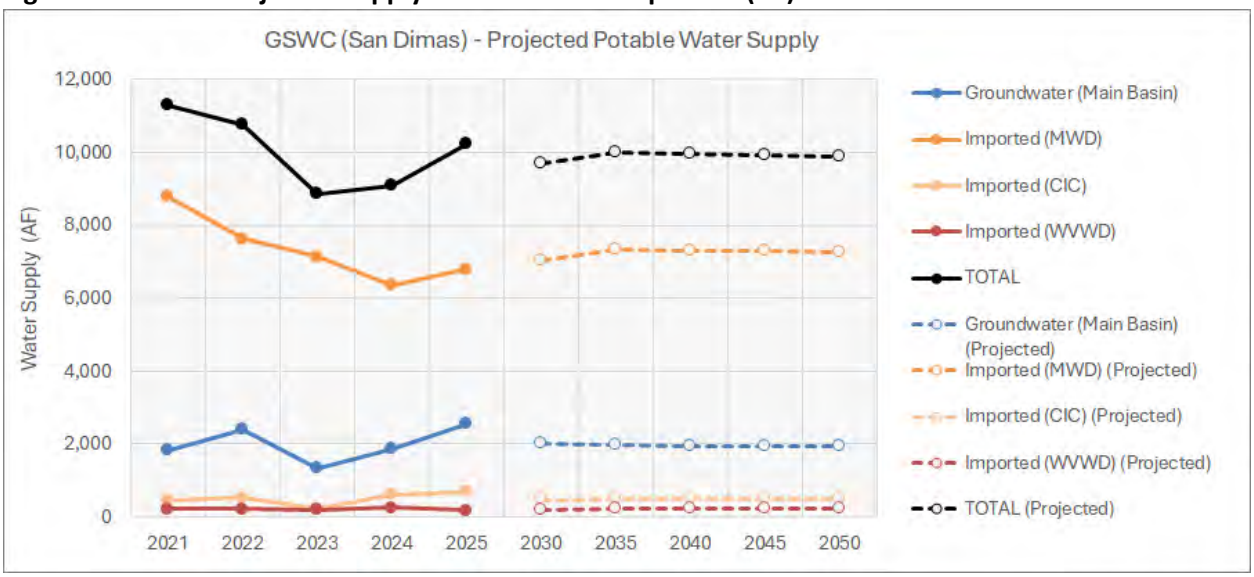
1. **Climate Change Adjustments:** Specific climate change vulnerability factors, derived from TVMWD's 2024 Climate Vulnerability Analysis, were applied to the 2021-2025 baseline local agency supplies (Main San Gabriel Basin groundwater) to forecast anticipated local yields through 2050.
2. **Imported Water Reliance:** The projected local supplies were then compared against GSWC's projected demand. Any projected unmet demand is assumed to be fulfilled by imported water purchases from TVMWD.

As shown in **Table 4-4** and **Figure 4-1**, GSWC's reliance on the Main Basin is projected to decrease slightly over time under a climate change planning scenario that models potential impacts to local hydrology. Under this specific scenario, imported water purchases from TVMWD are projected to increase modestly to balance the GSWC's overall supply portfolio and meet customer demands. It is important to note that these projections are intended for long-term vulnerability planning purposes only; they do not incorporate future adaptation or mitigation strategies currently being developed or implemented at the regional level. Future actions, such as those identified in the DCP, are specifically designed to reduce or offset these potential climate-related impacts to local groundwater supplies.

Table 4-4. DWR 6-9R Projected Water Supplies (AF)

Water Supply	Additional Detail on Water Supply	2030	2035	2040	2045	2050
Groundwater (not desalinated)	Main Basin	1,996	1,970	1,952	1,937	1,921
Purchased or Imported Water	Metropolitan Water District – TVMWD	7,036	7,321	7,310	7,294	7,278
Purchased or Imported Water	Covina Valley Water Company (formerly CIC)	478	497	496	495	494
Purchased or Imported Water	Walnut Valley Water District	204	212	211	211	211
	Total	**9,713**	**10,000**	**9,970**	**9,937**	**9,903**

Figure 4-1. GSWC Projected Supply and Demand Comparison (AF)



4.9. Energy Intensity of Water Supplies

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2025, GSWC consumed, 334.25 kWh of energy for water facilities per AF of water delivered.

5. Water Service Reliability Assessment

This section considers GSWC's water supply reliability during normal years, single dry years, and up to five consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from GSWC's current source of supply through 2050.

5.1. Constraints on Water Sources

While GSWC maintains a highly reliable water portfolio for the San Dimas system, its supply sources are subject to various environmental, regulatory, and infrastructural constraints. A comprehensive analysis of regional water supply constraints is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the RUWMP.

For GSWC – San Dimas System specifically, the primary constraints on water sources include:

- **Imported Water Reductions and Intertie Reliance:** GSWC-San Dimas relies heavily on treated imported water purchased from MWD via TVMWD. As detailed in **Part 1, Chapter 3**, MWD typically buffers statewide supply cuts using regional storage. However, during severe multi-year droughts when imported supplies are constrained, GSWC must shift its operational strategy. To offset imported water constraints, GSWC mitigates this risk by relying on its local Main San Gabriel Basin groundwater reserves, purchased supplies from CVWC, and actively utilizing its interconnection with WVWD to balance system demands.
- **Groundwater Quality:** Contaminants of Emerging Concern (CECs), such as PFAS, as well as legacy Volatile Organic Compounds (VOCs) in the Main San Gabriel Basin, can force GSWC to temporarily remove active extraction wells from service. To mitigate this constraint and ensure supply reliability, GSWC actively monitors its wellfield and invests in long-term capital improvement projects, as detailed in **Section 4.7**.
- **Climate Change Impacts on Surface Water:** GSWC's purchased supply from CVWC relies partially on San Gabriel River diversions. Furthermore, as established in **Section 4.3**, GSWC holds an Integrated Production Right that allows for surface water diversions from San Dimas Canyon Creek (or Main Basin groundwater pumping credits). As identified in **Part 1, Section 2.5**, this source is highly susceptible to climate-driven volatility, including shorter rainy seasons and severe post-wildfire turbidity. These climate change impacts can temporarily halt CVWC treatment operations and reduce the natural flows in San Dimas Canyon Creek, directly constraining GSWC's local supply yields.

5.2. Year Type Characterization

In general, groundwater is less vulnerable to seasonal and climatic changes than surface water (i.e. local and imported) supplies. The Main San Gabriel Basin Watermaster monitors groundwater levels and implements supplemental recharge to maintain long term sustainability of local groundwater sources.

Further discussion of regional water resource management is included in **Part 1 Chapter 3** of the 2025 RUWMP.

Because GSWC's baseline years are a mix of different hydrologic conditions, it is important to note how their supply strategy adapts to dry years. GSWC's primary local source of supply, the Main San Gabriel Basin (which integrates its San Dimas Canyon Creek surface water pumping credits), has a variable OSY that may decline during dry periods. However, under the basin's adjudication framework, GSWC can legally and physically continue to produce the water it needs to meet elevated dry-year demands by paying Replacement Water assessments for any production that exceeds its rights. As a result, GSWC's operational supply strategy is not significantly different in dry years compared to normal years. The changes in GSWC's projected baseline supply over time are primarily driven by long-term climate change factors (as detailed in **Section 4.8**) and planned infrastructure projects.

Per UWMP requirements, GSWC has evaluated reliability for an average year, single dry year, and a five consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** The single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** The driest five-year historical sequence for the supplier, which may be the lowest average water supply available for five years in a row.

To characterize these year types, GSWC evaluated historical supply and demand data. For the purposes of this 2025 UWMP, GSWC established a "Normal Year" baseline using the average annual supply and demand from 2021 through 2025.

Because water demand typically increases during dry years due to elevated outdoor irrigation needs, the "Single Dry Year" and "Five-Year Drought" scenarios are modeled using historical years where production peaked to meet elevated drought demands. **Table 5-1** summarizes the base years utilized for this analysis and the corresponding volume of water available/utilized as a percentage of the average year.

Table 5-1. DWR 7-1R Basis of Water Year Data

Year Type	Base Year (FY)	Volume Available (AF)	% of Average Supply
Average Year	2021-2025	10,039	100%
Single-Dry Year	2021	11,280	112%
Consecutive Dry Years 1st Year	2018	10,729	107%
Consecutive Dry Years 2nd Year	2019	9,846	98%
Consecutive Dry Years 3rd Year	2020	10,830	108%
Consecutive Dry Years 4th Year	2021	11,280	112%
Consecutive Dry Years 5th Year	2022	10,763	107%

5.3. Water Service Reliability

The results of the reliability assessment are summarized below.

As established in **Section 4.8**, GSWC utilized the "Real Water" (Utilization-Based) methodology to project its future supplies. Under this operational approach, GSWC projects its local groundwater supply based on historical averages adjusted for climate change. Any remaining unmet demand is fulfilled by purchasing imported water from TVMWD.

GSWC's projected "Normal Year" water demands over the next 25 years were developed using a demand-per-connection approach as discussed in **Section 4.8** and **Section 5.2**. This approach utilizes a baseline period of 2025 to approximate normal demand patterns; projects future connections based on SCAG growth rates and incorporates anticipated reductions due to passive conservation and compliance with the new "Making Conservation a California Way of Life" (CWOL) regulatory framework.

To estimate projected demands during drought conditions, GSWC utilized a historical ratio methodology. Because water demand in Southern California typically increases during hot, dry periods due to elevated outdoor irrigation needs, GSWC analyzed the ratio of total water utilized during historical dry periods compared to a historical average year.

Based on the GSWC's operational data, the historical average year baseline was established using the five-year period of FY 2021–2025 (averaging 10,039 AFY).

- **Single Dry Year Scaling:** The ratio of water utilized during the historical single dry year of FY 2021 (11,280 AF) to the historical average (10,039 AF) yielded a scaling factor of 112%. This **112%** factor was applied to the projected normal year demands to estimate GSWC's projected water demands during future single dry years.
- **Five-Year Drought Scaling:** To estimate demands during a five-consecutive-year drought, GSWC utilized the historical drought sequence from FY 2018 through FY 2022. The ratio of water utilized in each of these years (10,729 AF, 9,846 AF, 10,830 AF, 11,280 AF, and 10,763 AF, respectively) compared to the historical average yielded scaling factors of **107%, 98%, 108%, 112%, and 107%** for years one through five of the drought sequence, respectively. These factors were applied to the projected normal year demands to forecast future multi-year drought demands.

Because TVMWD and MWD have demonstrated 100% supply reliability to meet wholesale demands through 2050 (supported by MWD's 2025 UWMP supply reliability analysis (MWD, 2026), GSWC's total supply is projected to perfectly meet its total projected demand across all hydrologic scenarios. Consequently, the difference between supply and demand in the tables below is zero, reflecting a fully reliable water portfolio through the 2050 planning horizon.

Table 5-2, **Table 5-3**, and **Table 5-4** summarize GSWC's projected water supplies and demands over the next 25 years in five-year increments. These tables indicate GSWC can reliably meet elevated water demands during normal years, single dry years, and five-consecutive-year drought periods over the next 25 years.

Table 5-2. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	9,713	10,000	9,970	9,937	9,903
Demand totals	9,713	10,000	9,970	9,937	9,903
Difference	**0**	**0**	**0**	**0**	**0**

Table 5-3. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	10,914	11,237	11,203	11,166	11,128
Demand totals	10,914	11,237	11,203	11,166	11,128
Difference	**0**	**0**	**0**	**0**	**0**

Table 5-4. DWR 7-4R Multiple Dry Years Supply and Demand Comparison

Year	Totals	2030	2035	2040	2045	2050
First Year	Supply Totals	10,380	10,687	10,655	10,620	10,584
	Demand Totals	10,380	10,687	10,655	10,620	10,584
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	9,526	9,808	9,778	9,746	9,712
	Demand Totals	9,526	9,808	9,778	9,746	9,712
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	10,478	10,788	10,755	10,720	10,683
	Demand Totals	10,478	10,788	10,755	10,720	10,683
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	10,914	11,237	11,203	11,166	11,128
	Demand Totals	10,914	11,237	11,203	11,166	11,128
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	10,413	10,721	10,689	10,653	10,617
	Demand Totals	10,413	10,721	10,689	10,653	10,617
	Difference	**0**	**0**	**0**	**0**	**0**

6. Drought Risk Assessment

The Drought Risk Assessment (DRA) is an analysis required for the 2025 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2026. While Section 5 evaluated long-term reliability through 2050, the DRA serves as an immediate stress test, focusing specifically on the five-year period from 2026 through 2030. The purpose of this assessment is to determine if GSWC anticipates any supply shortages in the immediate future that would necessitate triggering mandatory demand reduction measures outlined in the Water Shortage Contingency Plan.

6.1. Data, Methods, and Basis for Water Shortage Conditions

To conduct the DRA, GSWC utilized the same "Real Water" supply methodology and historical drought scaling factors detailed in **Section 4.8** and **Section 5**. The assessment simulates a severe, five-consecutive-year drought mirroring the hydrology of Fiscal Years 2018 through 2022.

Because hot, dry weather drives increases in outdoor irrigation, GSWC's unconstrained demands are projected to scale up significantly during this period (up to 112% of average baseline demand, as established in **Section 5.3**). The DRA tests whether GSWC's local groundwater and imported water portfolios can sustain these elevated demands over the next five years without natural replenishment.

6.2. DRA Water Source Reliability

GSWC's near-term reliability is highly secure due to the active management of the Main San Gabriel Basin and the unprecedented storage reserves held by its wholesale providers.

Entering the 2026–2030 DRA period, MWD holds nearly 4 million acre-feet (MAF) of water in regional storage, which is a near-record high. MWD's 2025 UWMP DRA modeling confirms that even if the SWP and CRA experience five consecutive years of severe constraint, MWD has sufficient stored reserves to meet all wholesale member agency demands without shortage allocations through 2030. Consequently, TVMWD can reliably supply GSWC with imported water to cover any deficits caused by constrained local groundwater production.

6.3. Total Water Supply and Use Comparison

Table 6-1 details the DRA for the 2026–2030 period. As demonstrated in the table, GSWC's projected supplies are sufficient to fully and consistently meet the elevated, unconstrained demands for every year of the five-year drought sequence.

Because GSWC anticipates a supply surplus (a difference of zero) across all five years of the near-term drought scenario, GSWC does not currently project a need to implement mandatory, extraordinary conservation measures or trigger advanced stages of its WSCP due to supply shortages. However, GSWC remains committed to ongoing water conservation and will continue to enforce standard water waste prohibitions to preserve regional storage.

Table 6-1. DWR 7-5 Five-Year Drought Risk Assessment (AF)

Category	2026	2027	2028	2029	2030
Total Water Use (Demand)	10,380	9,526	10,478	10,914	10,413
Total Supplies	10,380	9,526	10,478	10,914	10,413
Surplus/Shortfall without WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP – Supply Augmentation Benefit	0	0	0	0	0
WSCP – Use Reduction Savings Benefit	0	0	0	0	0
Revised Surplus/(Shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP Action	**0%**	**0%**	**0%**	**0%**	**0%**

7. Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) is a strategic plan developed by GSWC to proactively manage and respond to both anticipated and unforeseen water shortages. A water shortage is defined as a condition in which available water supplies are inadequate to meet expected customer demand at a specific point in time. Such shortages may result from various factors, including but not limited to, water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demand.

GSWC's WSCP is a detailed approach which presents how GSWC intends to act, or respond, in the case of an actual water shortage. It outlines a process for conducting annual water supply and demand assessments and establishes clearly defined stages and response measures to respond to actual conditions. This level of preparedness enhances transparency, ensures accountability, and GSWC's ability to maintain reliable water service during periods of supply disruption.

The WSCP was prepared in conjunction with the 2025 RUWMP and is presented as a standalone document that may be updated, as necessary. No substantive changes have been incorporated into the 2025 WSCP compared to the 2020 version. Minor editorial updates were made for clarity and consistency; however, the content, procedures, and response actions remain relatively unchanged.

The GSWC's WSCP is included in **Part 4, Appendix F-7**.

8. Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that GSWC has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. GSWC met the 2025 Water Use Target through the implementation of these DMMs. GSWC expects to continue to implement current DMMs to encourage conservation and achieve its water use targets.

8.1. Existing Demand Management Measures

8.1.1. Water Waste Prevention Ordinances

GSWC supports local agencies and cities in efforts to adopt ordinances which will reduce water waste. Such ordinances include the City of San Dimas' Ordinance No. 1240, pertaining to water-efficient landscapes to reduce or eliminate water waste. GSWC also implements CPUC-approved rules including Rule 14.1 ("Water Conservation and Reduction Plan"), Schedule No. 14.1 ("Water Shortage Contingency Plan With Staged Mandatory Restrictions, Reductions And Drought Surcharges"), Schedule 14.1-SD ("Staged Mandatory Conservation and Rationing"), and Rule No. 20 ("Water Conservation"), which prohibit water waste. Copies of Ordinance No. 1240 and the CPUC documents are provided in **Part 4, Appendix F-4**.

In January 2016, the San Dimas City Council adopted Ordinance No. 1240, pertaining to water waste prevention measures. Ordinance No. 1240, which replaced the May 2010 Ordinance No. 1196, includes provisions for water management practices and water waste prevention for existing landscapes.

GSWC's Rule 14.1, when in effect, sets forth procedures to implement the following water conservation restrictions:

- Use of potable water for non-essential or unauthorized purposes, as defined by State law or local ordinances, is prohibited.
- Failure to repair leaks or system malfunctions within 48 hours of notification by the utility may result in service termination, unless alternate arrangements are approved by the utility.
- Outdoor irrigation that causes runoff onto adjacent properties, non-irrigated areas, sidewalks, streets, parking areas, or structures is prohibited.
- Washing vehicles with potable water is prohibited unless a hose with an automatic shut-off nozzle is used.
- Use of potable water to wash buildings or hard surfaces (e.g., sidewalks, patios, courts) is prohibited except when required to protect public health or safety.
- Use of potable water for street washing is prohibited, except for initial construction wash-down when street sweeping is not feasible or for public health and safety purposes.

- Use of potable water in decorative fountains or water features is prohibited unless the system recirculates water.
- Irrigation of non-functional turf at commercial, industrial, or institutional sites using potable water is prohibited.
- Outdoor watering during prohibited hours or within 48 hours after measurable rainfall (0.1 inches or more) is prohibited.
- Use of potable water to irrigate ornamental turf on public street medians is prohibited.

CPUC's Schedule 14.1-SD, when activated, imposes mandatory conservation restrictions above and/or declares a level of water shortage which adopts customer surcharges and reductions in water use (as discussed in Section 4 of the **WSCP – Appendix F-7**).

CPUC's Rule No. 20 discourages wasteful use of water and promotes the use of water saving devices. The stated purpose of the rule is to "ensure that water resources available to the utility are put to a reasonable beneficial use and that the benefits of the utility's water supply and service extend to the largest number of persons.

GSWC's most recent adoptions for Water Waste Prevention Ordinances are as shown:

Effective Dates:
Rule 14.1 - November 3, 2022
Schedule 14.1 - June 26, 2022
Rule 20 - February 2, 2015

8.1.2. Metering

GSWC meters all customer connections, including separate metering for single-family residential, commercial, industrial, and landscape customers. Furthermore, if there is new development within GSWC, each facility is individually metered. Service charges for GSWC are based on the customers' connection size. Further information regarding GSWC's service fees and conservation pricing is provided in **Section 8.1.3.**

GSWC has continuously metered all connections over the last five years.

8.1.3. Conservation Pricing

Beginning September 1, 2009, GSWC implemented a tiered conservation pricing rate structure for residential customers as approved by the CPUC. GSWC's current water rate structure is tiered to promote water conservation by customers. Single family residential customers are billed on an inclining block rate structure, with a fixed service charge based on meter size, to encourage water conservation and discourage waste. The rate structure includes three tiers. GSWC also has an inclining drought emergency surcharge pursuant to Schedule 14.1-SD ("Staged Mandatory Conservation and Rationing").

GSWC has continuously implemented conservation pricing for customer billing in accordance with its current rate schedule over the last five years.

8.1.4. Public Education and Outreach

GSWC offers public information programs for its customers. GSWC provides marketing and outreach materials to its customers by issuing press releases, publishing quarterly newsletters, and using door tags and sending bill inserts. Customers learn about rebates and additional programs through the GSWC website.

GSWC promotes water conservation through brochures, posters, activity booklets, public outreach displays, oral presentations, and workshops to inform the public. GSWC raises awareness through paid advertising, press releases, news ads, media events, and through the Speaker's Bureau.

GSWC regularly conducts water conservation school education programs through the Discovery Science Center for San Dimas elementary schools with an annual budget approved by CPUC. Students can receive a free conservation kit that includes a water survey and water saving devices. Results from the program are tracked annually in a comprehensive Program Summary Report which shows the estimated reduction in water usage achieved and the percentage of students who participated in the program. GSWC has been offering other school education programs since September 1992 to raise awareness of water issues including Water Awareness Art Contests, Water Education Grant Program, Water Resource Library, and much more.

GSWC is a United States Environmental Protection Agency WaterSense Partner and sponsors community events including Earth Day, Fix-a-Leak Week, and Water Awareness Months to encourage conservation and water efficiency. GSWC also plans to sponsor community workshops that educate and assist customers on achieving water use efficiency in their landscapes and home through landscape planning, efficient irrigation concepts, and proper turf reduction or removal.

Over the last five years, GSWC has continuously implemented public education and outreach activities.

8.1.5. Programs to Assess and Manage Distribution System Real Losses

GSWC's system is comprised mainly of single-family and multi-family dwellings. GSWC's water system losses range approximately from 4% to 9%, as discussed in **Section 2.1.3**. GSWC has water conservation literature that alerts customers to be on the lookout for irrigation leaks and to correct them promptly. GSWC is available to assist customers in answering questions regarding leaks or higher than expected water usage.

GSWC's Water Loss Control Program is used to prepare the annual water loss audits and monitor water losses. GSWC's Operations Engineering Department reviews the audits to track real and apparent losses. Losses are monitored by comparing water production to sales. In addition, the Operations Engineer contracts with leak detection companies to perform a survey if necessary. If the annual water loss audit indicates water losses exceed water system goals, a full leak survey will be performed to identify water

loss sources and impacts on the overall water system. Leak locations and work orders for repairs are also documented and processed for future water loss control actions.

GSWC will continue these programs to assess and manage distribution system real losses.

8.1.6. Water Conservation Program Coordination and Staffing Support

GSWC maintains a fully staffed water conservation department including the Vice President of Environmental Quality, a Water Use Efficiency Manager, and a Senior Water Efficiency Program Specialist. GSWC also utilizes consultants to support program development and implementation on an as-needed basis. GSWC plans to continue to provide water conservation program coordination and staffing support.

8.1.7. Other Demand Management Measures

GSWC implements additional DMM programs using both GSWC-only programs and programs in collaboration with regional partners. MWD administers additional DMM programs within its service area. Additional information is discussed below and provided in GSWC's *San Dimas Customer Service Area Rebates and Programs*, available at: https://www.gswater.com/sites/main/files/file-attachments/san-dimas-csa.pdf?1593474316

GSWC provides an audit program for high-use single-family and multi-family residential customers. These customers are identified through billing data and then contacted to offer free audits. Audits are also offered to walk-in customers at the local customer service area office.

GSWC participates in MWD's regional rebate program, the SoCal WaterSmart Program, which is available to the GSWC's residential and commercial customers. There are residential rebates available for the purchase of high-efficiency clothes washing (HECW) machines, premium high-efficiency toilets (PHET), weather-based irrigation controllers (Smart Controllers), rain barrels, rain cistern, and turf removal to promote water conservation. Some measures, including PHETs, Smart Controllers, and turf removal, are also available to commercial customers. GSWC's commercial customers are additionally offered plumbing, landscaping, HVAC, and medical and dental equipment rebates. GSWC provides information about these programs to customers on its website. GSWC plans to continue implementation of these programs to promote water conservation.

GSWC provides its customers with free high-efficiency conservation kits which include water savings devices and information. Kits include one (1) 1.5 GPM high efficiency showerhead, one (1) 1.5 GPM kitchen aerator, two (2) 1.0 GPM bath aerators, and leak detection tablets with instructions.

GSWC's large landscape program consists of identifying and contacting high-use customers, providing information on water use surveys, voluntary landscape water use budgets, and landscape training. The program is available to all large landscape customers free of charge.

Through the Water Savings Incentive Program (WSIP), GSWC customers are provided financial incentives for customized water efficiency projects such as the installation of commercial or industrial high-

efficiency equipment, industrial process improvements, agricultural and landscape water efficiency improvements, and water management services.

These programs have been continuously in effect for the last five years. GSWC plans to continue implementation of the programs described above to promote water conservation.

9. Adoption, Submittal, and Implementation

This section describes GSWC's process for adopting, submitting, and implementing the 2025 RUWMP and WSCP.

9.1. Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2025 UWMPs are part of the 2025 RUWMP to all cities and counties and other stakeholders within the region that 2025 RUWMP is being prepared. This notice was sent at least 60 days prior to GSWC's public hearing. The recipients are identified in **Part 1 Chapter 1** of the 2025 RUWMP and include all cities and counties within GSWC's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

GSWC provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4, Appendix F-2**.

9.2. Public Hearing and Adoption

GSWC held a public hearing on **May 26, 2026** to hear public comments and consider adopting this 2025 RUWMP and GSWC's WSCP. As part of the public hearing, GSWC provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2025 RUWMP took place before the adoption of the Plan, which allowed GSWC the opportunity to modify the 2025 RUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

GSWC'S adoption resolution for the 2025 RUWMP and GSWC's WSCP is included in **Part 4 Appendix F-3.**

9.3. Plan Submittal

GSWC will submit the 2025 RUWMP and the GSWC's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2025 RUWMP submittal to DWR will be done electronically through DWR's "Water Use Efficiency (WUE) Data Portal" website. The complete set of DWR Submittal Tables for the GSWC San Dimas System is included in **Part 4, Appendix F-5**.

9.4. Public Availability

Within 30 days of submitting its Plan to DWR, GSWC will make the 2025 RUWMP and GSWC's WSCP available for public review. Copies will be accessible during normal business hours at the GSWC customer service office and posted on GSWC's website for public viewing.

9.5. Notification to Public Utilities Commission

GSWC will submit the 2025 Plan (and WSCP) to the California Public Utilities Commission as part of its general rate case filings.

9.6. Amending an Adopted UWMP or WSCP

If the adopted 2025 RUWMP or GSWC's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 2: Local Agency Urban Water Management Plans

FINAL

2025 RUWMP

JUNE 2026

Part 2 Chapter 7: Rowland Water District 2025 Urban Water Management Plan



Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Appendices

Part 4, Appendix G of the 2025 RUMWP contains Agency Supporting Information.

Acronyms and Abbreviations

Acronym	Description
AB1668	Assembly Bill 1668
AF	Acre-feet
AFY	acre-feet per year
AMI	advanced metering infrastructure
AWWA	American Water Works Association
CII	commercial, industrial, and institutional
CRA	Colorado River Aqueduct
CWC	California Water Code
CWOL Regulation	“Making Conservation a California Way of Life” Regulation
DCP	Drought Contingency Plan
DIM	Dedicated Irrigation Meters
District	Rowland Water District
DMMs	Demand Management Measures
DRA	Drought Risk Assessment
EPA / USEPA	United States Environmental Protection Agency
FY	Fiscal year
GIS	geographic information systems
GPCD	gallons per capita per day
gpmd	gallons per mile of pipe per day
gpscd	gallons per service connection per day
GRIP	Groundwater Reliability Improvement Program
GRIP+	Groundwater Reliability Improvement Program (Plus)
kWh	kilowatt-hours
LACSD	Los Angeles County Sanitation Districts
LEF	Landscape Efficiency Factors
MAF	million acre-feet
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
PBWA	Puente Basin Water Agency
RHNA	Regional Housing Needs Assessment
RUWMP	Regional Urban Water Management Plan
SB606	Senate Bill 606
SCADA	SCADA system
SCAG	Southern California Association of Governments
SJCWRP	San Jose Creek Water Reclamation Plant
State Board	State Water Resources Control Board
SWP	State Water Project
TVMWD	Three Valleys Municipal Water District
UWMP	Urban Water Management Plan

UWUO	Urban Water Use Objectives
UWUO	urban water use objective
WEWAC	Water Education Water Awareness Committee
WRMP	Water Resources Master Plan
WRP	water reclamation plant
WSCP	Water Shortage Contingency Plan

Individual UWMP

This chapter describes information specific to Rowland Water District (District), including its supplies, demands, and water use efficiency programs. The information and analysis provided in this chapter supplements the regional information presented in **Part 1** of the 2025 Regional Urban Water Management Plan (RUWMP) and is provided to fulfill the District's reporting requirements for 2025 under the UWMP Act.

The regional analyses described in **Part 1** (Regional Context) of the 2025 RUWMP were conducted using a consistent analytical framework, assumptions, and methodologies that are directly applicable to the District. The District relies on Part 1 of the RUWMP for the lay description, regional water supply availability, and the underlying technical methodology used to evaluate water supply reliability under normal, single dry-year, multiple dry-year, and five-year drought stress-test conditions.

The water supply reliability assessment and Drought Risk Assessment (DRA) applicable to the District's Urban Water Management Plan (UWMP) are presented in plain language in **Part 1** of the 2025 RUWMP, specifically within **Chapter 5**.

Building upon that regional foundation, the District-specific supply and demand comparisons are presented in the tables within this UWMP. Unless otherwise noted, the conclusions of the regional water supply reliability assessment and DRA are directly applicable to the District and satisfy the requirements of the Urban Water Management Planning Act and the 2025 UWMP Guidebook. A completed Department of Water Resources (DWR) UWMP Compliance Checklist for the District is provided in **Part 4, Appendix G-1**.

1. System Description

This section describes the District's water system, service area, population demographics, local climate, and land uses.

Rowland Water District was formed in 1953 and provides potable and recycled water service to portions of the Cities of Industry, La Puente, and West Covina, and unincorporated areas of Los Angeles County including Rowland Heights and Hacienda Heights. The District's water service area covers approximately 17.2 square miles in southeastern Los Angeles County. The District's service area is shown in **Figure 1-1**.

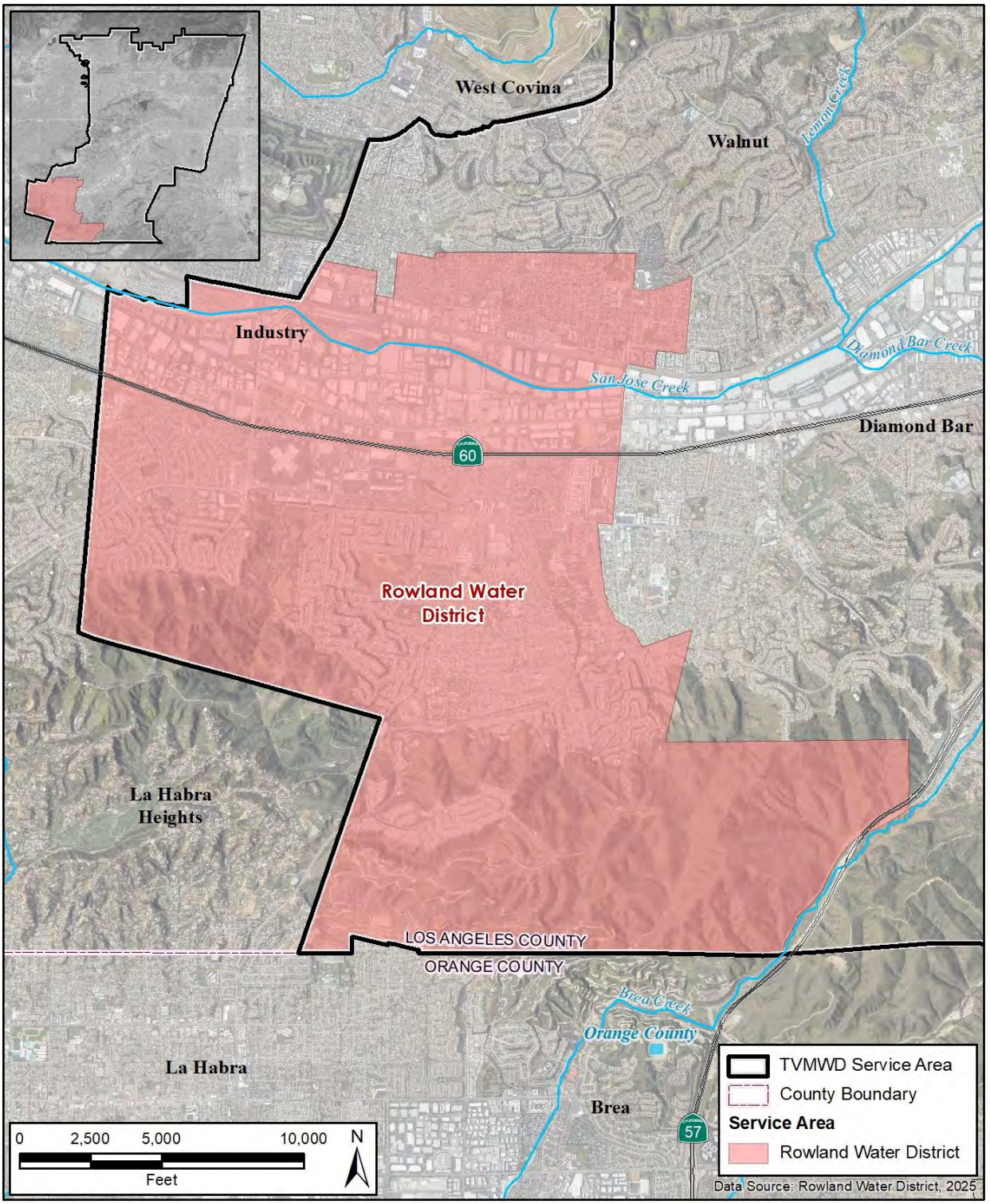
The District owns approximately 170 miles of potable water distribution mains. The District primarily obtains its water supply by purchasing treated imported water supplies from the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD). The imported potable water is treated either at MWD's Weymouth Treatment Plant or at TVMWD's Miramar Water Treatment Plant. The potable water supplies are delivered to the District through three imported water connections.

The District's other supplies consist of groundwater, imported groundwater, and recycled water. The District holds adjudicated pumping rights in the Puente Basin, which underlies part of its service area, and utilizes this groundwater for its recycled water system. The District also receives treated Puente Basin groundwater from the Carrier Treatment Facility, which operates as part of a United States Environmental Protection Agency's (EPA) Superfund cleanup project.

The District supplements its supplies with Central Basin groundwater delivered through a 0.8-mile, 12-inch pipeline and metering station connecting La Habra Heights County Water District to the District. Additional groundwater supplies from the Main San Gabriel Basin are purchased from California Domestic Water Company and conveyed through a 2.8-mile pipeline with an associated metering and booster pump station.

The District operates an extensive recycled water system consisting of approximately 20 miles of distribution mains and a recycled water reservoir with a storage capacity of 5 million gallons.

Figure 1-1. Service Area



1.1. Service Area

The District is a retail public water supplier that meets the definition of an urban water supplier with 13,546 municipal water service connections in 2024. The regional climate, which includes the District's service area, is described in **Part 1 Chapter 2** of the 2025 RUWMP.

1.1.1. Population, Demographics, and Socioeconomics

Estimates of population served by the District are based on the 2020 U.S. Census Bureau and the Southern California Association of Governments (SCAG) (Southern California Association of Governments, 2024). A geographic information systems (GIS) analysis of 2020 Census data was used to determine the District's 2020 service area population, which was 55,270. The 2020 population and the number of residential connections served by the District in 2020 were used to derive a 2020 persons per residential connection factor of 3.5. This factor was then multiplied by the number of connections in 2025 to estimate the 2025 population served by the District. To project the population served by the District from 2030 to 2050, A Census-based growth rate from 2010-2024 of 0.19% was applied to 2025 and used to receive population projections until 2050.

Estimated current and projected populations of the District's service area are included in **Table 1-1**.

Table 1-1. Current and Projected Population

Population Served	2025	2030	2035	2040	2045	2050
Total	56,961	57,495	58,033	58,576	59,124	59,678

The estimated 2025 and projected future number of households and employees within the service area were estimated using the same approach as population. SCAG projected an increase in households from 2019 to 2035 averaging 0.16% per year and from 2035 to 2050 averaging 0.11% per year. SCAG projected an increase in employment from 2019 to 2035 averaging 0.04% per year and from 2035 to 2050 averaging 0.00% per year. The estimated number of households and employees were determined by linear interpolation between SCAG projections for 2019, 2035, and 2050 as shown in **Table 1-2.**

Table 1-2. SCAG Household and Employment Projections for Water Service Area

Category	2025	2030	2035	2040	2045	2050
Households	16,792	16,930	17,066	17,159	17,253	17,347
Employees	36,969	37,036	37,104	37,113	37,122	37,130

According to U.S. Census Bureau QuickFacts from 2024, the median household income in the District is $85,617. The District's poverty rate is 12%. The District is 10% white alone, 61% Asian alone,1% black alone, 7% two or more races, and 29% Hispanic or Latino. The average commute to work for workers at least 16 years of age is 32 minutes, which indicates that most jobs are local (United States Census Bureau, 2024). According to 2024 U.S. Census Bureau QuickFacts, the District's population is made up of 23% of seniors (65 years and over), 16% of persons under 18 years, and 3% of persons under five years. (United States Census Bureau, 2024). **Table 1-2** provides employment and household projections for the District's water service area based on SCAG GIS data intersected with the water service area.

1.1.2. Land Use

Per the Fiscal Year (FY) 2024-2025 TVMWD Assessed Service Area by Land Use, the District's land use distribution by parcel count is as follows:

- Single-Family Residential: 80%
- Multi-Family Residential and Condominiums: 14%
- Mobile Homes: <1%
- Commercial: 2%
- Churches: <1%
- Industrial: 3%
- Vacant Residential: <1%
- Vacant Non-Residential: <1%

2. Water Use

This section describes the current and projected water uses within the District's service area.

2.1. Water Use by Sector

2.1.1. Water Use Sectors Listed in Water Code

Water suppliers are required to identify water uses to the extent that records are available, for at least each of the water use sectors identified in CWC 10631(d) to assist in the water demand projections. Recycled water uses are described in **Section 4.5.**

The District serves the following water uses:

Single Family Residential

Single family residential customers are typically on a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.

Multi-Family Residential

Multi-family residential customers are typically multiple dwelling units within one building or several buildings within one complex.

Landscape Irrigation

The District tracks the water use for landscape irrigation.

Commercial/Institutional

The District tracks commercial and institutional customer water uses as one. Commercial customers typically provide or distribute a product or service, and institutional water customers are typically public services, such as higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

Losses

Distribution system water losses are the water losses from the point of water entry to the distribution system to the delivery point to the customer's system. Water losses are discussed in **Section 2.1.3**.

The number of active connections is shown in **Table 2-1**.

Table 2-1. Calendar Year 2021-2025 Connection by Customer Class

Customer Class	2021	2022	2023	2024	2025
Residential – Single Family	11,547	11,548	11,553	11,582	11,683

Customer Class	2021	2022	2023	2024	2025
Residential – Multi-Family	390	429	450	450	450
Landscape	299	300	387	388	398
Industrial	-	-	-	-	-
Commercial/Institutional	1,119	1,123	1,124	1,126	1,176
Total	**13,355**	**13,400**	**13,514**	**13,546**	**13,707**

2.1.2. Past and Current Water Use

The District serves potable water for a variety of uses, as summarized in **Table 2-2**. Over the past four years, the District served an average of 8,730 AFY of potable water. In 2025, 56% of the total potable water deliveries were to residential customers (42% to single-family accounts and 13% to multi-family accounts). **Table 2-2** shows the annual volume of water used by each customer class for 2025.

Table 2-2. DWR 4-1R Actual Demands for Water, 2025, AFY

Use Type	Potable or Non-Potable (*optional)*	2025 Volume
Single Family	Potable	3,777
Multi-Family	Potable	1,183
Commercial	Potable	3,745
Landscape	Potable	225
Distribution System Water Losses	Potable	509
	Total	**9,439**

2.1.3. Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. The District monitors its water loss and prepares an annual American Water Works Association (AWWA) Water Audit to estimate the volume of water loss. The District has submitted all required water loss audits to the State, as shown in **Table 2-3**. Copies of the District's recent AWWA audits are provided in **Part 4, Appendix G-6**.

Table 2-3. DWR 4-5R Month Water Loss Audit Reporting

Public Water System ID # Reported in DWR Table 2-1R	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910194	2020	Yes
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes

DWR Notes:
2020 AWWA: Rowland V5-CY20_v2.xls
2021 AWWA: Rowland-CY21_v2.xls
2022 AWWA: CA1910194-Rowland-CY2022_L1V.xlsx
2023 AWWA: FWAS v6.0_release version 20210211.xlsx
2024 AWWA: FWAS_ROWD_CY2024.xlsx

CWC Section 10608.34 required the State Resources Control Board (State Board) to develop water loss performance standards for urban retail water suppliers to minimize water waste through system leaks. Water loss performance standards were developed through a rulemaking that became effective in 2023. Under the regulations, each supplier will be required to comply, by 2028, with an individualized volumetric water loss standard based on real loss, using the economic model developed by the State Board and the supplier's own unique data. Real loss is the physical loss of water from water distribution systems, as opposed to apparent losses, which are revenue losses due to meter inaccuracies, billing errors or unauthorized consumption. A supplier's baseline water loss is calculated as the average water loss from at least 3 of the 4 water loss audits from 2017 – 2020. The real water loss performance standard is based on gallons per service connection per day (gpscd), or gallons per mile of pipe per day (gpmd), depending on how the supplier reports real loss. Post-2028 compliance with volumetric water loss standards will be assessed every three years based on the average of the supplier's real loss from the preceding three years, with an allowed variation of 5 gallons per connection per day above the supplier's water loss standard. Apparent loss standards are equal to the baseline apparent loss and compliance is evaluated at the same time as compliance with the Real Water Loss Performance Standard.

Although the compliance period has not yet started, CWC Section 10631 (d)(3)(C) requires water suppliers to provide data in the UWMP to show whether the supplier met its State Board water loss performance standard.

Over the last four years, the District water losses have ranged from 1% to 6% when calculated as the difference between billed consumption and total production. To project the water loss component of future demands, the District assumed future water losses will be approximately 4% of total customer water use through 2030 and 5% through 2050. Calculated water losses are shown in **Table 2-4**.

Based on data released by the State on January 30, 2026, the District's baseline real water loss is 23.5 gpscd and the real water loss standard is 22.3 gpscd, and the apparent loss standard is the baseline of 13.6 gpscd. No reduction from the baseline is required to meet the water loss standard by 2028. As shown in **Table 2-5**, based on the most recent water loss audit from 2024, the District met the real water

loss performance standard. **Section 8.1.5** discusses District's programs to assess and manage distribution system real loss.

Table 2-4. Calculated Water Loss

Water Loss	2022	2023	2024	2025
Calculated Water Loss	118	328	524	509
% Water Loss	1%	4%	6%	5%

Table 2-5. DWR 4-6R Progress Towards 2028 Water Loss Standard

Public System ID # Reported in Submittal Table 2-1R	Did the Water Board Calculate a Water Loss Standard for this Public System?	2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Standard	Number of Units	Volume of Total Real Water Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Real Water Loss per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Apparent Water Loss per Unit per Day
CA1910194	Yes	22.3	gpscd	13,582	266	17.5	13.6	gpscd	13,582	153	10.1

2.2. Projected Water Use

The "Making Conservation a California Way of Life" Regulation (CWOL Regulation) establishes unique water budget-based Urban Water Use Objectives (UWUO) for each urban retail water supplier in the State. The CWOL Regulation requires suppliers to calculate an annual UWUO consisting of these core components:

> UWUO = Residential Indoor Water Use Budget + Residential Outdoor Water Use Budget + Commercial, Industrial, and Institutional (CII) Dedicated Irrigation Meters (DIM) Outdoor Water Use Budget + Real Water Loss Budget

Each component has associated water efficiency standards that become increasingly stringent through 2040 as shown in **Table 2-6**. The key standards are residential indoor GPCD, Landscape Efficiency Factors (LEF), and real water loss measured in gallons per service connection per day. Annually updated supplier-specific input data is also required for population, climate, landscapes, and real water losses. The UWUO does not include some uses, such as CII indoor use or other uses that are considered "Excluded Demands".

Table 2-6. Water Efficiency Standard by Reporting Period

Year	Residential Indoor GPCD	Residential Outdoor LEF	CII DIMs	Real Water Loss Budget[1]
FY 23/24	55	0.8	Actual Reported "Landscape" Volume	Actual Reported or Budget
FY 25/26	47	0.8	Actual Reported "Landscape" Volume	Actual Reported or Budget
FY 30/31	42	0.8	0.8 LEF (starts July 1, 2028)	Budget (starts July 1, 2027)
FY 35/36	42	0.63	0.63 LEF	Budget
FY 40/41	42	0.55	0.45 LEF	Budget

Notes:
1. Budget = Supplier standard for real water loss (gallons per service connection per day) applied to total service connections

DWR and the State Board have developed an annual reporting framework, tools, and guidance for calculating the UWUO and comparing it to the actual use for that year. The State Board's "Water Use Objective Exploration Tool" allows users to enter varying efficiency standards and baseline year(s) of input data to calculate and visualize a comparison of historic demand to the UWUO with selected standards. The State Board's "Annual UWUO and Water Use Report" tool pre-populates input data and standards for the given reporting year. To project demands for this UWMP, a demand tool that aligns with the framework, data, and calculations of the State Board's tools was used and expanded to allow for forecasting future years' demand considering future efficiency standards, supplier input data, and growth assumptions.

Supplier input data and growth assumptions used in this UWMP for future years are shown in **Table 2-7**. Projected growth for residential indoor usage is associated with population projections as described in **Section 1.1.1**. Residential landscape area growth is associated with connections growth scaled with SCAG's housing projections as described in **Section 1.1.1**. The historic landscape area provided by the

State in its UWUO tools was divided by the 2025 residential service connections to create a landscape area per connection factor that was applied to future connections to account for growth. Landscape connections were assumed to scale with SCAG's employee projections as described in **Section 1.1.1**. Excluded demand growth was assumed to scale with the ratio of historic Excluded Demand to the UWUO applied to future UWUO estimates. The Real water loss standard is applied to the sum of all projected future connections.

Table 2-7. UWUO Components Growth Assumptions

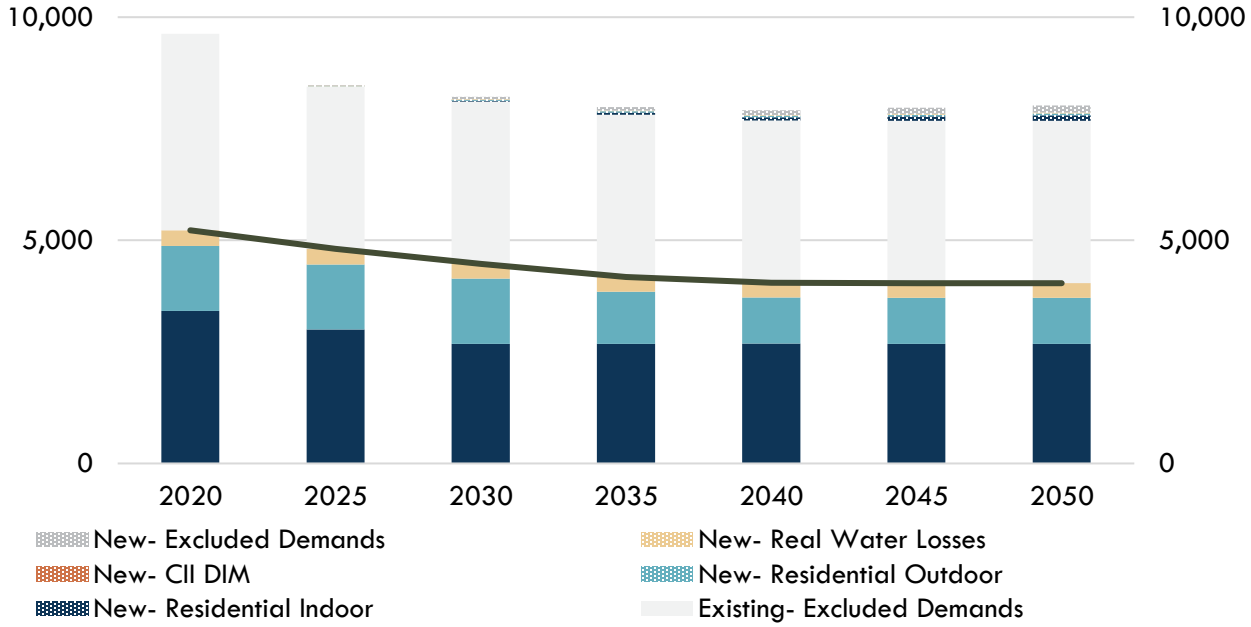
UWUO Component	Supplier Input Data	Input Data for Growth	Associated Assumption
Residential Indoor	Population	2025-2050 population	See **Section 1.1.1**
Residential Landscape	Landscape area & annual climate data	2025 Irrigable Irrigated Residential Landscape Area per Service Connection scaled to future connections.	SCAG household projections growth rate applied to connections. Historic average climate data from the State is used for future years.
CII DIM Landscape	Water use	Historic Landscape water use per service connection scaled to future connections.	SCAG employees annual growth rate applied to "Landscape" connections.
Real Water Loss	Connections	Supplier standard for Real Water Loss (gallons per service connection per day) applied to future total connections.	Sum of future connections including UWUO & Excluded Demand categories connections.
Excluded Demand (not included in UWUO but included in total demand)	Water use	n/a	Ratio of historic Excluded Demand to UWUO applied to future UWUO estimates.

Future efficiency standards (see **Table 2-6)** were applied to existing customer residential population, residential landscaped area, CII landscape usage, and total connections. These demand components for existing customers are shown to reduce over time as the standards become more stringent. Excluded demands were assumed to grow at the ratio of historic Excluded Demand to the UWUO. The most stringent standards in **Table 2-6** for FY 40/41 were applied to all new growth connections for all time periods, recognizing that new construction will comply with efficient building codes. The resulting projected UWUO, excluded demands, and total demands for both existing and new growth connections are shown in **Table 2-8** and **Figure 2-1**.

Table 2-8. UWUO Projections by Component, AFY

Category	2030	2035	2040	2045	2050
Existing - Residential Indoor	2,680	2,680	2,687	2,680	2,680
Existing - Residential Outdoor	1,462	1,167	1,029	1,029	1,029
Existing - CII DIM	0	0	0	0	0
Existing - Real Water Losses	330	330	331	330	330
Existing- Future Total UWUO Demand Target	4,472	4,177	4,047	4,039	4,039
Existing - Excluded Demands	3,636	3,636	3,636	3,636	3,636
Existing - Total Demand	8,107	7,813	7,683	7,674	7,674
New - Residential Indoor	25	50	76	102	121
New - Residential Outdoor	18	26	31	37	44
New - CII DIM	0	0	0	0	0
New - Real Water Losses	15	17	19	21	25
New - Total UWUO Demand	59	94	127	160	190
New - Excluded Demands	49	79	107	134	160
New - Total Demand	108	173	234	294	350
Existing & New - Total UWUO Demand	4,530	4,271	4,174	4,198	4,229
Existing & New - Excluded Demands	3,685	3,715	3,743	3,770	3,796
Existing & New - Total Demand	8,215	7,986	7,916	7,968	8,025

Figure 2-1. UWUO Projections by Component, AFY



While the District intends to meet the UWUO, it was also considered that demands may continue in alignment with historic patterns initially and take more time than anticipated to reach direct alignment with the UWUO. Therefore, demands used for the purposes of supply reliability planning are assumed to trend from a historic baseline pattern downward to the UWUO by 2050.

A historic baseline demand per connection per customer type is used to approximate current "normal" demand patterns representative of a range of conditions for influential factors impacting demand, known as "demand drivers". A key demand driver is rainfall. Ideal baseline years incorporate impacts of dry and wet years since demand typically fluctuates with rainfall due to the need for more irrigation in dry years and less in wet years. For this UWMP, a baseline period of 2022-2025 is used, which captures two wet years and two dry years. Using demands in these years, a baseline water use was established for each connection type, then reduced at a constant rate to meet the UWUO water use for that connection type by 2050.

Figure 2-2 shows the UWUO and the baseline trend to the UWUO projection scenarios and **Table 2-9** presents the projected demand by customer type through 2050 for this UWMP.

Figure 2-2. Historical and Projected Demand Scenarios

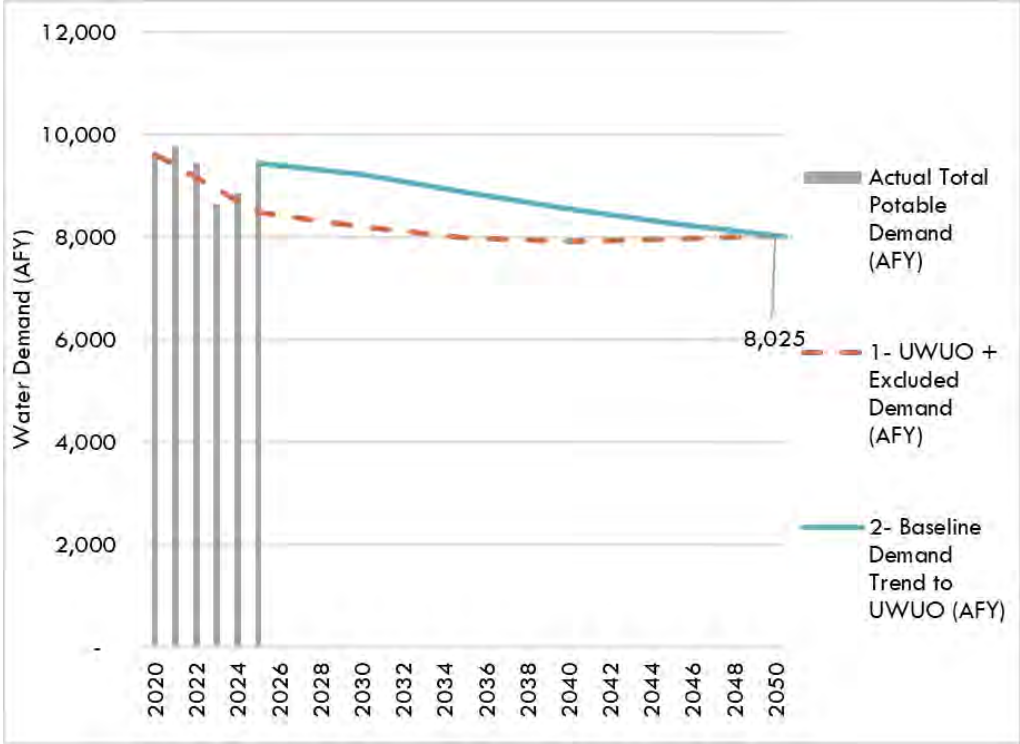


Table 2-9. DWR 4-2R Projected Demands for Potable Water, AFY

Use Type	Additional Description	Level of Treatment When Delivered	Projected Water Use 2030	Projected Water Use 2035	Projected Water Use 2040	Projected Water Use 2045	Projected Water Use 2050
Single Family		Potable	3,730	3,469	3,232	3,020	2,830
Multi-Family		Potable	1,195	1,112	1,037	970	910
Commercial		Potable	3,679	3,701	3,724	3,746	3,769
Landscape		Potable	284	247	215	187	163
Distribution System Water Loss		Potable	346	347	350	351	353
		Total	9,234	8,877	8,558	8,275	8,025

Table 2-8, Table 2-9, and **Table 2-10** satisfy the requirement to include anticipated water conservation savings when developing future demand projections since they account for water efficiency standards set by the State for the UWUO. Conservation savings were considered and included in developing demand estimates for the next 25 years. However, the District considers projected demand to plan for supply reliability if demands continue in alignment with historic patterns rather than in direct alignment with the UWUO. The District is complying with and planning for UWUO standards as described in **Sections 3** and **8**.

Senate Bill 1087 requires that water use projections in an UWMP include projected water use associated with single family and multi-family residential housing for lower income households, as identified in the housing elements of any city, county, or city and county within the supplier's service area. The Regional Housing Needs Assessment (RHNA) establishes housing needs for each jurisdiction over the applicable planning period. SCAG adopted the 6th Cycle RHNA Allocation Plan, which covers the planning period from October 2021 through October 2029 (SCAG, 2021). SCAG's population and household projections inform the RHNA Allocation Plan and are used in the determination and allocation of housing needs, including lower income housing, for individual jurisdictions. The growth projections in this UWMP are based on SCAG projections for the service area and therefore also incorporate the lower income housing projections. The projected demands in this UWMP represent water use from all future growth and are inclusive of water use for lower income households.

Table 2-10. DWR 4-3R Inclusion in Water Use Projections

Question	Yes or No
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included in Projections?	Yes

2.3. Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. A recent Climate Change Vulnerability Assessment utilizing data from DWR and 20 global climate models suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** of the 2025 RUWMP includes an assessment of the potential impacts of climate change.

3. SB X7-7 Compliance & Future Water Use Efficiency Requirements

This section describes compliance with the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7). The section demonstrates compliance with the 2020 SBX7-7 target and discusses future water use efficiency requirements.

3.1. Compliance and Future Water Use Efficiency Requirements

SBX7-7 was incorporated into the UWMP Act in 2009 and required that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20% by the year 2020.

SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, March 2021) specify methodologies for determining the baseline water demand, 2015 interim urban water use target, and the 2020 urban water use target for the District as described in the 2020 UWMP. This section also demonstrates that the District achieved its 2020 water use target.

Table 3-1 below establishes the District's 2020 actual and 2020 target GPCD. As shown, the District met its 2020 target. Most recently, in 2025, the water use was 148 GPCD, which is well below the 2020 target of 174 GPCD.

Table 3-1. SB X7-7 2020 Target Progress

2020 Target GPCD	2020 Actual GPCD	Did Supplier Achieve Target?
174	145	Yes

New water use efficiency standards from the CWOL Regulation supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the "2018 Water Conservation Legislation." Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation, each urban retail water supplier must comply with its UWUO. DWR and the State Board have developed a reporting framework for calculating the UWUO and compliance annually with efficiency standards becoming increasingly stringent through 2040.

The demand projections in this UWMP are based on the District meeting its estimated future UWUO, as described in **Section 2.2** in order to plan and implement necessary demand management measures (DMMs) (described in **Section 8**) to support meeting the UWUO. DMMs and UWUO compliance planning enhance resiliency for drought and other water shortage conditions as described in **Sections 5, 7, and 8**.

4. Water Supply

The District's primary sources for water supply include groundwater pumped from the Main San Gabriel Basin (Main Basin), Central Basin, and Puente Basin, treated imported surface water purchased from the MWD through TVMWD, and recycled water purchased from the Los Angeles County Sanitation Districts (LACSD). The District also purchases treated groundwater from the Main Basin produced by California Domestic Water Company (CDWC). The District's main source of water supply is treated imported water. More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2025 RUWMP.

4.1. Purchased or Imported Water

4.1.1. Three Valleys Municipal Water District

The District purchases treated, imported water from MWD through TVMWD. MWD imports water from the Colorado River through the Colorado River Aqueduct (CRA), owned and operated by MWD, and the State Water Project (SWP), which utilizes the California Aqueduct for transmission to Southern California. Water delivered to TVMWD's member agencies can receive treated imported water from MWD's Weymouth Treatment Plant located in the City of La Verne or from TVMWD's Miramar Water Treatment Plant located in the City of Claremont.

The District treated imported water supplies from MWD, through TVMWD, may be impacted during a multi-year drought or other conditions which limits MWD from delivering sufficient water supplies to all its member agencies, and consequently to the District. A description of this supply and its reliability is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the 2025 RUWMP**.**

4.1.2. Purchased Water from California Domestic Water Company

The District can purchase treated groundwater produced by CDWC. Walnut Valley Water District (WVWD) and the District (through the Puente Basin Water Agency [PBWA]) entered into a "Water Production and Delivery Agreement" with CDWC in February 2011. The agreement allows for the delivery of up to approximately 5,000 AFY of potable water from the Main Basin to WVWD and the District. Under this joint agreement, the District's specific share of these annual deliveries is expected to be up to 2,500 AFY. Pursuant to the agreement, CDWC began delivering water to the District during FY 2016-17. In order to maximize production, the Pathfinder Pipeline was constructed and will enable the transmission of water from CDWC into WVWD's distribution system. Although the District does not directly pump from the Main Basin for potable supplies, a discussion regarding groundwater supplies from the Main Basin is provided in **Part 1, Chapter 3** of the RUWMP.

4.2. Groundwater

The District can extract groundwater from three regional groundwater basins: Main Basin, Central Basin, and Puente Basin. All three basins have been adjudicated and managed for long-term sustainability, as discussed further in **Part 1 Chapter 3** of the RUWMP**.**

4.2.1. Main Basin

Per the "Water Production and Delivery Agreement" with CDWC, the District can purchase treated groundwater from the Main Basin. The Watermaster manages the basin through an Operating Safe Yield (OSY), which is determined annually based on groundwater elevations and rainfall. On May 1, 2024, Watermaster conducted a public hearing and approved Resolution No. 05-25-321 establishing the OSY at 160,000 acre-feet for FY 2024-25, 140,000 acre-feet for FY 2025-26, 140,000 acre-feet for FY 2026-27, 140,000 acre-feet for FY 2027-28, and 140,000 acre-feet for FY 2028-29.

CDWC's share of the OSY is 6.25547%.

4.2.2. Central Basin

The Central Basin is actively managed by the Water Replenishment District of Southern California which serves as the Central Basin Watermaster. The District's current allowed pumping allocation in the Central Basin is 1 AFY. While the District does not currently pump from the Central Basin, it plans to obtain additional groundwater supplies from the Central Basin in the future through the PBWA. The PBWA's current Allowed Pumping Allocation in the Central Basin is 965 AFY. The District's future projected supplies from the Central Basin are presented in **Section 4.8**. Although the district has not pumped any water from the Central Basin in the last five years, the basin is included as a source in **Table 4-1** to maintain consistency with the District's long-term supply projections.

4.2.3. Puente Basin

The District has adjudicated water rights from the Puente Basin and pumps groundwater for use in the District's recycled water system. Groundwater from the Puente Basin is used for non-potable purposes, including irrigation through the District's recycled water distribution system.

The Puente Basin is actively managed by the Puente Basin Watermaster. The adjudicated water rights in the Puente Basin are 4,400 AF. Through adoption of an annual OSY, the Puente Basin Watermaster has the ability to reduce the amount of water rights available to Producers. According to the Puent Basin Watermaster 39th Annual Report, the Watermaster adopted an OSY of 2,506 acre-feet and estimated each of the subsequent four years to be 2,506 acre-feet.

On an annual basis, Pumpers are allocated a Share of the Operating Safe Yield and Return Flow Credits. Should a Pumper not produce its full entitlement, the Judgment allows for the portion not pumped to be used in the following (first) year. These rights are termed Carry-over Rights. However, unproduced Carry-over Rights cannot be carried beyond one year and are lost, thus becoming Lost Carry-over. For the Puente

Basin, a total of 2,360.8 acre-feet were carried over from Fiscal Year 2024-2025 to Fiscal Year 2025-26. The District's share of the OSY for FY 2025-26 is 550 AF.

Table 4-1 summarizes the District's actual groundwater production over the past five years. Pumping volumes fluctuate annually based on total system demand, the availability of surface water, and local hydrological conditions.

Table 4-1. DWR 6-1R Groundwater Pumped Last Five Years (AF)

Groundwater Type	Location or Basin Name	2021	2022	2023	2024	2025
Alluvial Basin	Central Basin	0	0	0	0	0
Alluvial Basin	Puente Basin	217	380	363	414	341
	Total	**217**	**380**	**363**	**414**	**341**

4.3. Surface Water

The District does not use local surface water supplies to meet its water demands and does not have riparian surface water rights to meet demand.

4.4. Stormwater

The District does not directly use stormwater to meet its water demands.

4.5. Wastewater and Recycled Water

Wastewater generated by the District is treated by LACSD. Wastewater is collected within the LACSD's local sewer collection system. The District's local sewers tie into one of LACSD's regional trunk sewers. The regional trunk sewer lines deliver wastewater to the San Jose Creek Water Reclamation Plant (SJCWRP) and the A.K. Warren Water Resource Facility (formerly known as the Joint Water Pollution Control Plant); however, the percentage breakdown between these two plants in treating the District's wastewater in unknown. The water reclamation plants are not located within the District's service area.

To align with current conservation realities and CWOL framework, wastewater generation is estimated utilizing the State's 2025 indoor residential water use standard of 47 GPCD (as indoor water use serves as the direct proxy for wastewater generation). Based on the District's 2025 population of 56,961, the estimated amount of wastewater collected by the District is approximately 2.68 MGD (about 3,000 AFY).

Table 4-2 shows existing wastewater collection and treatment at LACSD.

4.5.1. Potential, Current, and Projected Recycled Water Uses

The District uses recycled water for landscape irrigation, construction, cooling towers, and industrial processes. The District plans to increase recycled water use within its service area by expanding the recycled water system to additional parks, schools, nurseries, and additional commercial landscaping areas. The District primarily receives recycled water supplies from LACSD's SJCWRP. The District also

pumps untreated groundwater from Puente Basin and the volume extracted counts against the District's allocation under the judgement. Additionally, the District uses treated water from the United States Environmental Protection Agency's (USEPA) superfund Carrier cleanup project (including groundwater from the Puente Basin) to meet recycled water demand. The District's groundwater received from Carrier is exempt from the judgement.

In addition, WVWD can deliver recycled water to the District through an emergency recycled water connection.

The District continues to retrofit landscape irrigation systems to use recycled water where available. Future recycled water use projections are based on current recycled water use and planned recycled water projects. The amount of treated non-potable groundwater (from the Puente Basin) used to augment the system was excluded from the recycled water volume delivered to each customer.

The District plans to continue to increase delivery capacity and expand the recycled water system to serve additional customers. Because of the uncertainties associated with the reliability of imported water supplies, the economic value of a recycled water system continues to increase.

The District's 2020 UWMP projected recycled water use in 2025 to be 1,300 AF. The District's recycled water use in 2025 was 1,132 AF.

Table 4-2. DWR 6-2R Wastewater Collected within Service Area in 2025 (AF)

Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Volume of Wastewater Collected from UWMP Service Area 2025**	**Name of Wastewater Treatment Plant (WWTP) and Place ID Number**	**Is WWTP Located Within UWMP Area?**
LACSD	Estimated	3,000 AF	SJCWRP, Place ID 260156	No
	Total	**3,000 AF**		

4.6. Water Exchanges and Transfers

As mentioned in **Section 4.1**, the Water Production and Delivery Agreement with WVWD and the District with the CDWC allow for the delivery of up to approximately 5,000 AFY of potable water from the Main Basin. The District's share of annual deliveries is expected to be 2,500 AF. Pursuant to the terms of the Storage and Export Agreement signed on July 1, 2015 and approved on September 4, 2015 between Puente Basin Watermaster (Rowland Water District and WVWD) and the Main Basin Watermaster, up to 30,000 AF of imported surface water can be stored in the Main Basin in advance of, and in exchange for, groundwater which is produced and sold to the District by CDWC. Approximately 22,166 AF of water is currently stored by the District and WVWD in the Main Basin.

The District does not have any current or planned transfer opportunities.

4.7. Future Water Projects

The District continues to expand its water supply portfolio in order to reduce reliance on imported water. One future project involves the Central Basin. Under the Central Basin Judgment, the Puente Basin Water Agency(PBWA) may export up to an additional 2,500 AF of water from the Central Basin, and PBWA continues to evaluate opportunities to develop additional potable supplies from this source.

Additionally, as part of the TVMWD Water Resources Master Plan (WRMP) and Drought Contingency Plan (DCP) with the member agencies, the District is currently pursuing several projects to increase water supply reliability. Future projects include:

- Six Basins Groundwater Project – the District in partnership with the WVWD, has entered into a project agreement through Puente Basin Water Agency to jointly develop new extraction wells. This project is expected to increase overall supply by approximately 1,500 AF.
- Covina Irrigating Company Interconnection – the District in partnership with the WVWD, has entered into a project agreement through Puente Basin Water Agency to jointly improve system interties. This project is expected to increase overall supply by approximately 2,000 AF.

Four regional water supply projects were also identified in the WRMP and DCP effort through collaboration with TVMWD, member agencies, and regional stakeholders. These regional projects, described in **Part 1, Chapter 3**, are intended to enhance overall supply reliability for the region.

- Project 1: External Partnership with Covina Valley Water Company – Main Basin
- Project 2: TVMWD Groundwater Reliability Improvement Program (GRIP)
- Project 3: TVMWD Storing Water in Main San Gabriel Basin (GRIP+)
- Project 4: TVMWD–Pomona Chino Basin Conjunctive Use Exchange

As development progresses and increased demands are placed on the system, the District will determine which projects to implement.

4.8. Summary of Existing and Planned Sources of Water

The District's water supply is comprised of treated imported water, groundwater, and recycled water. The volume of water utilized from each source in 2025 is summarized in **Table 4-3**, and projected supply is summarized in **Table 4-4**.

Table 4-3. DWR 6-8R Actual Water Supplies in 2025 (AF)

Water Supply	Additional Detail on Water Supply	2025 Actual Volume	2025 Potable or Non-Potable (*optional*)	2025 Total Entitlement (*optional*)
Groundwater (not desalinated)	Puente Basin	341	Non-Potable	
Purchased or Imported Water	Main Basin	1,344	Potable	
Purchased or Imported Water	Metropolitan Water District – TVMWD	8,095	Potable	
Recycled Water	San Jose Creek Water Treatment Plant	542	Non-Potable	
Purchased or Imported Water	Walnut Valley Water District	21	Non-Potable	
	Total – Potable	**9,439**		
	Total – Non-Potable	**904**		
	Total – All	**10,343**		-

Supply Projection Methodology

To project future water supplies accurately and conservatively, the District, in coordination with TVMWD, evaluated supply projection methodologies. Rather than projecting supplies based on maximum legal entitlements or absolute physical extraction capacity, the District opted to utilize a "Real Water" (Utilization-Based) approach. This approach grounds future projections in empirical operational reality. The methodology utilized a baseline representing the District's average local supply utilization over the most recent five-year period (2021–2025), which was 10,225 acre-feet per year (AFY). This baseline smoothed out historically dry years (e.g., 2021) and historically wet years (e.g., 2023).

To calculate the projected supplies shown in **Table 4-4**, the following steps were applied:

1. **Climate Change Adjustments:** Specific climate change vulnerability factors, derived from TVMWD's 2024 Climate Vulnerability Analysis, were applied to the 2021–2025 baseline local agency supplies (such as Main Basin and Puente Basin groundwater) to forecast anticipated local yields through 2050. Recycled water projections were incorporated based on system capacity and historical averages.
2. **Integration of Future Local Projects:** As detailed in **Section 4.7**, the projections incorporate the planned activation of new local supplies, including the Six Basins Groundwater Project (anticipated to begin yielding supply by 2030) and the Central Basin supply (anticipated to begin yielding supply by 2035).

3. **Imported Water Reliance:** The projected local groundwater and recycled supplies were then compared against the District's projected demand. Any projected unmet demand is assumed to be fulfilled by imported water purchases from MWD through TVMWD.

Potable and Non-Potable System Accounting

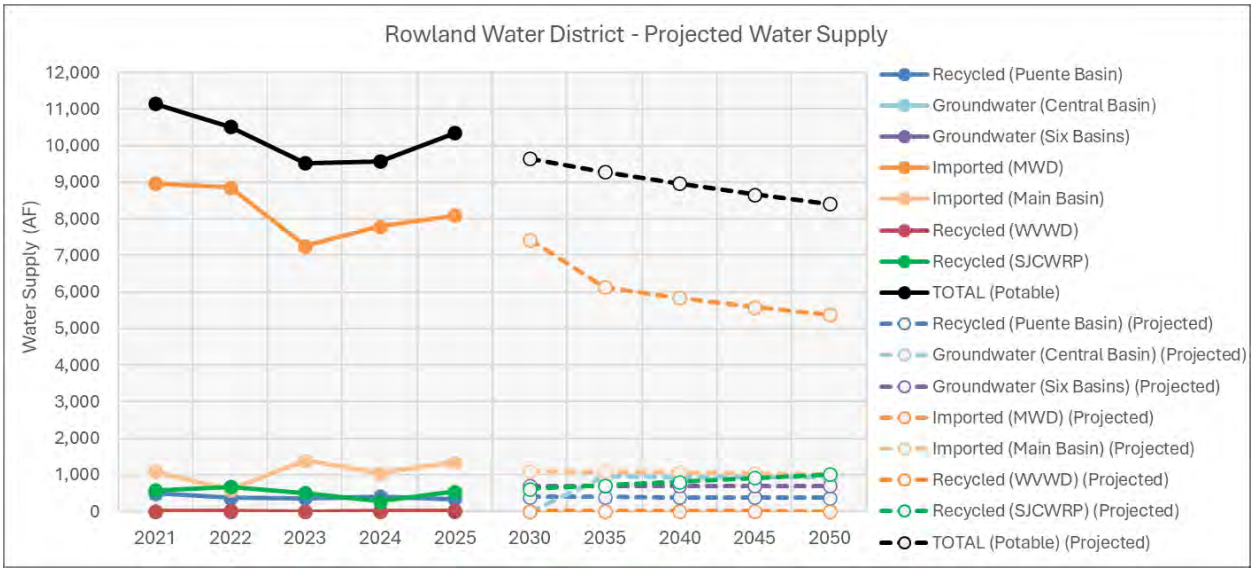
Because the District operates physically separate potable and non-potable distribution systems, the total projected supplies shown in **Table 4-4** reflect an aggregation of both systems. To accurately reflect this separation for planning purposes, projected recycled water and non-potable groundwater supplies are scaled to strictly equal the projected non-potable demands. The remaining supplies are dedicated exclusively to the potable system. There is no crossover of non-potable supplies to meet potable demands, maintaining a transparent and accurate projection of supply sufficiency for each distinct system.

As shown in **Table 4-4** and **Figure 4-1**, while the District's existing baseline local supplies (such as Main Basin imported groundwater and Puente Basin recycled water) are projected to experience slight declines over time under this specific climate change planning scenario, the District's reliance on imported water from TVMWD is projected to decrease significantly over the planning horizon. This reduction in imported water dependence is driven by the District's proactive strategy to balance its overall supply portfolio by integrating new local groundwater supplies (Six Basins and Central Basin) and expanding recycled water deliveries (San Jose Creek WRP) to meet shifting customer demands. It is important to note that the climate-adjusted projections for existing supplies are intended for long-term vulnerability planning purposes only; they do not incorporate future adaptation or mitigation strategies currently being developed or implemented at the regional level. Future actions, such as those identified in the DCP, are specifically designed to reduce or offset these potential climate-related impacts to local supplies.

Table 4-4. DWR 6-9R Projected Water Supplies (AF)

Water Supply	Additional Detail on Water Supply	2030	2035	2040	2045	2050
Recycled Water	Puente Basin	402	399	392	382	370
Groundwater (not desalinated)	Six Basins	700	700	700	700	700
Groundwater (not desalinated)	Central Basin	0	957	949	941	933
Purchased or Imported Water	Main Basin	1,101	1,092	1,073	1,047	1,012
Purchased or Imported Water	Metropolitan Water District – TVMWD	7,433	6,128	5,836	5,588	5,380
Recycled Water	Walnut Valley Water District	15	12	12	11	11
Recycled Water	San Jose Creek WRP	616	716	816	916	1,016
	Total – Potable	**9,234**	**8,877**	**8,558**	**8,276**	**8,025**
	Total – Non-Potable	**1,033**	**1,127**	**1,220**	**1,309**	**1,397**
	Total – All	**10,267**	**10,004**	**9,777**	**9,584**	**9,421**

Figure 4-1. Rowland Water District Projected Supply and Demand Comparison (AF)



4.9. Energy Intensity of Water Supplies

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2025, the District consumed 174 kWh per acre-foot (AF) of potable water and 584 kWh per AF of recycled water for water facilities of water delivered.

5. Water Service Reliability Assessment

This section considers the District's water supply reliability during normal years, single dry years, and up to five consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from the District's current source of supply through 2050.

5.1. Constraints on Water Sources

While the District maintains a highly reliable water portfolio, its supply sources are subject to various environmental, regulatory, and infrastructural constraints. A comprehensive analysis of regional water supply constraints is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the RUWMP.

For Rowland Water District specifically, the primary constraints on water sources include:

- **Imported Water Supply Reductions:** Historically, the District has relied heavily on imported water supplies. As detailed in **Part 1, Chapter 3**, MWD typically buffers statewide supply cuts using its massive regional storage portfolio. However, during severe multi-year droughts when imported supplies become constrained, the District may face constraints on the volume of imported water available from MWD through TVMWD. To offset these potential constraints, the District actively mitigates its imported water reliance through its Water Production and Delivery Agreement with Main Basin (CDWC), aggressive expansion of its recycled water system, and the planned integration of Six Basins and Central Basin groundwater.
- **Groundwater Basin Yield Fluctuations and Climate Change:** While the District does not directly pump potable groundwater from the Main Basin, its purchased supply from CDWC established by the Main San Gabriel Basin Watermaster. As described in **Part 1, Chapter 2**, prolonged droughts and climate-driven volatility reduce natural basin recharge, which can result in lowered OSY determinations. The District successfully mitigates this vulnerability by proactively storing imported surface water in the Main Basin in advance of, and in exchange for, groundwater produced by CDWC.
- **Infrastructure Capacity:** Maximizing local supply integration requires ongoing pipeline upgrades and system interconnections. As identified in **Section 4.7**, the District is actively pursuing capital improvement projects, such as the Covina Irrigating Company Interconnection, to ensure the physical infrastructure is in place to reliably distribute diversified water sources throughout the service area.

5.2. Year Type Characterization

In general, groundwater and recycled water are less vulnerable to seasonal and climatic changes than imported surface water supplies. The respective Watermasters for the Puente Basin, Main Basin, and Central Basin monitor groundwater levels and implement management strategies to maintain the long-term sustainability of local groundwater sources. Recycled water, which makes up an expanding portion

of the District's portfolio, is highly resilient to drought. Further discussion of regional water resource management is included in **Part 1 Chapter 3**.

Because the District's baseline years are a mix of different hydrologic conditions, it is important to note how the District's supply strategy adapts to dry years. The District's primary local potable supply relies on treated groundwater purchased from CDWC out of the Main San Gabriel Basin, which has a variable OSY that may decline during dry periods. However, under the basin's adjudication framework and the District's Storage and Export Agreement, the District can legally and physically continue to meet elevated dry-year demands by drawing upon the extensive imported water it has proactively stored (banked) in the basin. This conjunctive use, combined with MWD's highly reliable regional storage for direct imported deliveries, ensures that the District's operational supply strategy is not significantly different in dry years compared to normal years. The changes in the District's projected baseline supply over time are primarily driven by long-term climate change factors (as detailed in **Section 4.8**) and the planned integration of new local infrastructure projects.

Per UWMP requirements, the District has evaluated reliability for an average year, single dry year, and a five consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** The single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** The driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

To characterize these year types, the District evaluated historical supply and demand data. For the purposes of this 2025 UWMP, the District established a "Normal Year" baseline using the average annual supply and demand from 2021 through 2025.

Because water demand in the District typically increases during dry years due to elevated outdoor irrigation needs, the "Single Dry Year" and "Five-Year Drought" scenarios are modeled using historical years where production peaked to meet elevated drought demands. **Table 5-1** summarizes the base years utilized for this analysis and the corresponding volume of water available/utilized as a percentage of the average year.

Table 5-1. DWR 7-1R Basis of Water Year Data

Year Type	Base Year (FY)	Volume Available (AF)	% of Average Supply
Average Year	2021-2025	10,225	100%
Single-Dry Year	2021	11,152	109%
Consecutive Dry Years 1st Year	2018	11,516	113%
Consecutive Dry Years 2nd Year	2019	10,855	106%
Consecutive Dry Years 3rd Year	2020	10,759	105%
Consecutive Dry Years 4th Year	2021	11,152	109%
Consecutive Dry Years 5th Year	2022	10,522	103%

5.3. Water Service Reliability

The results of the reliability assessment are summarized below.

As established in **Section 4.8** and **Part 1, Chapter 5**, the District utilized the "Real Water" (Utilization-Based) methodology to project its future supplies. Under this operational approach, the District projects its local groundwater, purchased CDWC water, and recycled water supplies based on historical averages adjusted for climate change, alongside the integration of new planned local projects. Any remaining unmet demand is fulfilled by purchasing imported water from TVMWD.

The District's projected "Normal Year" water demands over the next 25 years were developed using a demand-per-connection approach as discussed in **Section 4.8** and **Section 5.2**. This approach utilizes a baseline period of 2025 to approximate normal demand patterns, projects future connections based on SCAG growth rates and incorporates anticipated reductions due to passive conservation and compliance with the new CWOL regulatory framework.

To estimate projected demands during drought conditions, the District utilized a historical ratio methodology. Because water demand in Southern California typically increases during hot, dry periods due to elevated outdoor irrigation needs, the District analyzed the ratio of total water utilized during historical dry periods compared to a historical average year.

Based on the District's operational data, the historical average year baseline was established using the five-year period of FY 2021–2025 (averaging 10,225 AF).

- **Single Dry Year Scaling:** The ratio of water utilized during the historical single dry year of FY 2021 (11,152 AF) to the historical average (10,225 AF) yielded a scaling factor of 109%. This **109%** factor was applied to the projected normal year demands to estimate the District's projected water demands during future single dry years.
- **Five-Year Drought Scaling:** To estimate demands during a five-consecutive-year drought, the District utilized the historical drought sequence from FY 2018 through FY 2022. The ratio of water utilized in each of these years (11,516 AF, 10,855 AF, 10,759 AF, 11,152 AF, and 10,522 AF, respectively) compared to the historical average yielded scaling factors of **113%, 106%, 105%, 109%, and 103%** for years one through five of the drought sequence, respectively. These factors

were applied to the projected normal year demands to forecast future multi-year drought demands.

Because TVMWD and MWD have demonstrated 100% supply reliability to meet wholesale demands through 2050 (supported by MWD's 2025 UWMP supply and reliability analysis (MWD, 2026), the District's total supply is projected to perfectly meet its total projected demand across all hydrologic scenarios. Consequently, the difference between supply and demand in the tables below is zero, reflecting a fully reliable water portfolio through the 2050 planning horizon.

Potable and Non-Potable System Accounting

To accurately reflect the separation of the District's potable and non-potable distribution systems, the supply and demand totals presented in the reliability tables below assume that projected recycled water supply strictly equals recycled water demand for non-potable uses. All other water supplies listed are utilized exclusively to meet potable demands. There is no crossover of non-potable supplies to meet potable demands; as such, the demonstrated supply reliability applies independently and sufficiently to both the potable and non-potable systems.

Table 5-2, **Table 5-3**, and **Table 5-4** summarize the District's projected water supplies and demands over the next 25 years in five-year increments. These tables demonstrate the District can reliably meet elevated water demands during normal years, single dry years, and five-consecutive-year drought periods over the next 25 years.

Table 5-2. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	10,267	10,004	9,777	9,584	9,421
Demand totals	10,267	10,004	9,777	9,584	9,421
Difference	0	0	0	0	0

* Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6.** The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-4**.

Table 5-3. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

Totals	2030	2035	2040	2045	2050
Supply totals	11,198	10,911	10,664	10,453	10,275
Demand totals	11,198	10,911	10,664	10,453	10,275
Difference	0	0	0	0	0

* Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6.** The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-4**.

Table 5-4. DWR 7-4R Multiple Dry Years Supply and Demand Comparison

Year	Totals	2030	2035	2040	2045	2050
First Year	Supply Totals	11,563	11,267	11,012	10,794	10,611
	Demand Totals	11,563	11,267	11,012	10,794	10,611
	Difference	0	0	0	0	0
Second Year	Supply Totals	10,900	10,620	10,380	10,175	10,002
	Demand Totals	10,900	10,620	10,380	10,175	10,002
	Difference	0	0	0	0	0
Third Year	Supply Totals	10,803	10,527	10,288	10,085	9,913
	Demand Totals	10,803	10,527	10,288	10,085	9,913
	Difference	0	0	0	0	0
Fourth Year	Supply Totals	11,198	10,911	10,664	10,453	10,275
	Demand Totals	11,198	10,911	10,664	10,453	10,275
	Difference	0	0	0	0	0
Fifth Year	Supply Totals	10,565	10,295	10,062	9,863	9,695
	Demand Totals	10,565	10,295	10,062	9,863	9,695
	Difference	0	0	0	0	0

*Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6.** The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-4**.

6. Drought Risk Assessment

The Drought Risk Assessment (DRA) is an analysis required for the 2025 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2026. While Section 5 evaluated long-term reliability through 2050, the DRA serves as an immediate stress test, focusing specifically on the five-year period from 2026 through 2030. The purpose of this assessment is to determine if the District anticipates any supply shortages in the immediate future that would necessitate triggering mandatory demand reduction measures outlined in the Water Shortage Contingency Plan.

6.1. Data, Methods, and Basis for Water Shortage Conditions

To conduct the DRA, the District utilized the same "Real Water" supply methodology and historical drought scaling factors detailed in **Section 4.8** and **Section 5**. The assessment simulates a severe, five-consecutive-year drought mirroring the hydrology of Fiscal Years 2018 through 2022.

Because hot, dry weather drives increases in outdoor irrigation, the District's unconstrained demands are projected to scale up during this period (up to **109%** of average baseline demand, as established in **Section 5.3**). The DRA tests whether the District's local groundwater, purchased CDWC water, recycled water, and imported water portfolios can sustain these elevated demands over the next five years without natural replenishment.

6.2. DRA Water Source Reliability

The District's near-term reliability is highly secure due to the active management of the regional groundwater basins (including the Main, Puente, and Central Basins), the consistent utilization and expansion of its recycled water system, and the unprecedented storage reserves held by its wholesale providers.

Entering the 2026–2030 DRA period, MWD holds nearly 4 million acre-feet (MAF) of water in regional storage, which is a near-record high. MWD's 2025 UWMP DRA modeling confirms that even if the SWP and CRA experience five consecutive years of severe constraint, MWD has sufficient stored reserves to meet all wholesale member agency demands without shortage allocations through 2030. Consequently, TVMWD can reliably supply the District with imported water to cover any deficits caused by constrained local groundwater production.

6.3. Total Water Supply and Use Comparison

Table 6-1 details the DRA for the 2026–2030 period. As demonstrated in the table, the District's projected supplies are sufficient to fully and consistently meet the elevated, unconstrained demands for every year of the five-year drought sequence.

Because the District anticipates a supply surplus (a difference of zero) across all five years of the near-term drought scenario, the District does not currently project a need to implement mandatory,

extraordinary conservation measures or trigger advanced stages of its WSCP due to supply shortages. However, the District remains committed to ongoing water conservation and will continue to enforce standard water waste prohibitions to preserve regional storage.

Table 6-1. DWR 7-5 Five-Year Drought Risk Assessment (AF)

Category	2026	2027	2028	2029	2030
Total Water Use (Demand)	11,563	10,900	10,803	11,198	10,565
Total Supplies	11,563	10,900	10,803	11,198	10,565
Surplus/Shortfall without WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP – Supply Augmentation Benefit	0	0	0	0	0
WSCP – Use Reduction Savings Benefit	0	0	0	0	0
Revised Surplus/(Shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP Action	**0%**	**0%**	**0%**	**0%**	**0%**

7. Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) is a strategic plan developed by the District to proactively manage and respond to both anticipated and unforeseen water shortages. A water shortage is defined as a condition in which available water supplies are inadequate to meet expected customer demand at a specific point in time. Such shortages may result from various factors, including but not limited to, water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demand.

The District's WSCP is a detailed approach which presents how the District intends to act, or respond, in the case of an actual water shortage. It outlines a process for conducting annual water supply and demand assessments and establishes clearly defined stages and response measures to respond to actual conditions. This level of preparedness enhances transparency, ensures accountability, and supports the District's ability to maintain reliable water service during periods of supply disruption.

The WSCP was prepared in conjunction with the 2025 RUWMP and is presented as a standalone document that may be updated as necessary. No substantive changes have been incorporated into the 2025 WSCP from the 2020 version, with the exception of an update to the District's tiered commodity rate structure. Minor editorial updates were made for clarity and consistency; however, the content, procedures, and response actions remain relatively unchanged.

On November 4, 2025, the District held a public hearing to consider transitioning to a two-tier rate structure and subsequently adopted Resolution No. 11-2025 (**Part 4**, **Appendix G-3**), approving updated rates and service charges for potable and recycled water and amending the reserve policy. The revised rate structure aligns with gallons per capita per day (GPCD) targets and improves rate clarity.

During the preparation period, the District was operating under Stage 2 of its WSCP for the majority of the time; however, conditions improved and the District subsequently transitioned out of Stage 2. The WSCP was implemented as adopted during the most recent drought and did not require modification. The District will continue to follow the WSCP and adjust its stage level as needed to remain in compliance with any future state conservation orders.

The District's WSCP is included in **Part 4, Appendix G-7**.

8. Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the DMMs that the District has implemented for the past five years, is currently implementing, and plans to implement to reduce demand. The District met the 2025 Water Use Target through the implementation of these DMMs. The District expects to continue to implement current conservation programs to encourage conservation and achieve its water use targets.

8.1. Existing Demand Management Measures

8.1.1. Water Waste Prevention Ordinances

The District adopted Ordinance No. 0-7-2018 ("Establishing a Water Conservation and Water Shortage Contingency Plan") in July 2018. The ordinance implements measures to ensure sufficient water supplies are available for sanitation, fire suppression, and domestic use. In addition, the District must reduce its demand for imported water to avoid penalties for excessive use and ensure sufficient water supply for the health, safety, and welfare of the public.

Ordinance No. 0-7-2018 recommends water conservation practices including the following:

- Limits on watering hours including no watering or irrigation of lawn, landscape or other vegetated area with potable water between the hours of 8:00 a.m. to 5:00 p.m.
- Eliminating watering or irrigating of any lawn, landscape, or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch.
- Washing down of hard or paved surfaces only using a bucket, a hand-held hose with a positive self-closing water shut-off device, a low volume high-pressure cleaning machine, or a low-volume high-pressure water broom.
- Repairing all plumbing and irrigation leaks and/or breaks as soon as possible.
- Serving of drinking water at establishments should be upon request only.
- Lodging establishments should offer customers the option of not having towels and linens laundered daily.

A copy of Ordinance No. 0-7-2018 is provided in **Part 4**, **Appendix G-4**. The District has continuously implemented its Water Waste Prevention Ordinance over the last five years.

8.1.2. Metering

The District meters all customer connections, including separate metering for single-family residential, multiple family residential, commercial, and landscape customers. Furthermore, if there is new development within the District, each facility is individually metered. Service charges for the District are

based on the customers' meter size. Further information regarding the District's service fees and conservation pricing is provided in **Section 8.1.3**.

As discussed in Section 9 of the WSCP (**Part 4, Appendix G-7**), the District has installed smart meters on all services connections. Smart meters provide multiple benefits including demand forecasting, leak detection, performance indicators, and improved reporting. By leveraging this data, the District can monitor, identify, and target programs to specific users. This allows the District to focus conservation messaging and programs on specific groups and individual customers. Smart meters can also provide information on when and where water is used, help establish water budgets, provide water usage alerts and comparisons of water use against other customers. They also facilitate forecasting and quick leak detection.

The District has continuously metered all connections over the last five years.

8.1.3. Conservation Pricing

The District's current water rates structure is tiered to promote water conservation by customers. Single family residential customers are billed on an inclining block rate structure, with a fixed service charge based on meter size to encourage water conservation and discourage waste. The rate structure includes two tiers and differs based on pressure zones within the District. The District has an inclining drought rate structure for specific water shortage levels (discussed in Section 3 of the WSCP (**Part 4, Appendix G-7**) to encourage additional water conservation. The District's current drought rate structure is also provided in **Part 4, Appendix G-3**. The District also has a recycled water rate to encourage recycled water use instead of potable water use. The District's current recycled water rates are also provided in **Part 4, Appendix G-3**.

The District has continuously implemented conservation pricing for customer billing in accordance with its current rate schedule over the last five years.

8.1.4. Public Education and Outreach

The District developed a public information program in 1998 to educate the public on the benefits of water conservation. The District periodically includes informational flyers with water bills to address water conservation and other important matters. The District periodically holds public workshops to promote water conservation.



The District provides water conservation information and updates on its website and a quarterly newsletter ("Rowland Quarterly") to inform and educate customers. In addition, the District hosts annual Landscape Workshops which include succulent giveaways. These giveaways are often promoted in conjunction with encouraging customers to register for paperless billing ("Save a Tree, Plant A Succulent").



As part of a public outreach program for water conservation, the District representatives have visited schools for classroom presentations to discuss water conservation. The District's water education programs for schools include the following:

- EduBuck Program: The EduBuck program provides financial support for teachers seeking creative water focused classroom projects to increase students' awareness of the importance of water as a resource.

- Splash Cash Program: water education grant program designed to increase students' awareness of the importance of water in Southern California. It is also intended to improve and supplement academic instruction by providing financial support to projects.
- Project WET (Water Education for Teachers) Workshop: Project WET is a workshop for teachers to receive water-related materials that can be implemented into their curriculum.
- National Theatre for Children: The National Theatre for Children offers a live interactive theater performance discussing water conservation and the importance of protecting our natural resources.
- Patch Program: The Patch Program is intended to teach local scouts and students about the significance of water supplies.
- Water Awareness Poster Contest: the District holds an annual poster contest to encourage students to think about the importance of using water more wisely or new ideas to conserve water.
- Water Conservation Campaign: the District holds a contest for middle school and high school students. The objective of the contest is to increase awareness of the importance of water in Southern California by creating a video or digital artwork specifically focused on water conservation issues.
- Water Scholar Program: the District holds an essay contest for high school seniors in the fall. The objective of this program is to promote water awareness and encourage students to compose an essay focused on water conservation issues.
- Water Drop Pledge: Students participate in a pledge promising to conserve water and be environmental stewards.
- The District will continue school education programs to promote water conservation to that sector of the community.
- Mini Solar Challenge Program has water conservation lessons for 5th and 6th grade students.



During community events and Fix-A-Leak Week, the District offers shower heads, kitchen aerators and raffles off other conservation supplies throughout the year. In addition, the District also distributes poppy seeds to promote drought-tolerant gardening. The District will notify its customers of these community events through its regular community outreach methods including social media posts, website sliders, and quarterly newsletters.

Over the last five years, the District has continuously implemented public education and outreach activities. The District will continue these programs to promote water conservation.

8.1.5. Programs to Assess and Manage Distribution System Real Losses

The District has incorporated a water loss control program since 1987. The District's system is comprised mainly of single and multi-family dwellings. The District has water conservation literature that alerts customers to be on the lookout for leaks and to correct them promptly. The District is available to assist customers in answering questions regarding leaks or higher than expected water usage.

The District's leak detection program includes notifying customers of potential leaks on their property based on their water usage. Potential leaks are identified by unusually high meter reads or by the District's customer service and billing staff when preparing monthly water bills. In the event of a potential leak, the District service representative is dispatched to further investigate and notify the customer. The District also has a proactive meter testing and replacement program to ensure accurate results.

In addition, the District has other methods for identifying leaks including the following:

- Utilization of advanced metering infrastructure (AMI).
- Residential water audits.
- Annual water balance system audits and water balance reconciliation.

- Large and small meter testing and replacement.
- SCADA system sensor calibration.

Over the last five years, the District has continuously implemented the activities described here each year. The District will continue these programs to assess and manage distribution system real losses.

8.1.6. Water Conservation Program Coordination and Staffing Support

Various District staff are involved in the District's water conservation program, including operations personnel who constantly monitor water waste, and customer service staff who respond to conservation questions. In addition, the Customer Service department reviews bills for high water usage to identify any potential leaks. The District also employs an education program coordinator and Senior Water Efficiency Specialist who are responsible for water conservation activities.

Water conservation activities focus on public outreach programs, including:

- Preparing and distributing conservation materials, the District's newsletter, and updating the District's website and social media outlets.
- Coordinating with local schools to provide water education programs.
- Coordinating with the public to provide conservation information booths at events.
- Outreach, including water saving tips, provided to the community during droughts.



The District plans to continue to provide water conservation program coordination and staffing support.

8.1.7. Other Demand Management Measures

The District participates in MWD's regional rebate program, the SoCal Water$mart Program, which is available to the District's residential and commercial customers. There are rebates available for indoor plumbing including high-efficiency clothes washers and toilets. Rebates are also available for outdoor plumbing include those for weather-based irrigation controllers, rotating sprinkler nozzles, and replacement of irrigated lawn with drought tolerant plants or other approved landscape options. The District's commercial customers are offered plumbing, landscaping, HVAC, and medical and dental equipment rebates. The District provides information about these programs to customers on its website.

In addition, the District has implemented additional conservation programs, including the Landscape Makeover Program and the Flume Device Pilot Program. The Landscape Makeover Program was offered within the last five years but is no longer active. The District plans to continue implementation of ongoing programs promote water conservation.



9. Adoption, Submittal, and Implementation

This section describes the District's process for adopting, submitting, and implementing the 2025 RUWMP and WSCP.

9.1. Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2025 UWMPs are part of the 2025 RUWMP to all cities and counties and other stakeholders within the region that that 2025 RUWMP is being prepared. This notice was sent at least 60 days prior to the District's public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within the District's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

The District provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4, Appendix G-2**.

9.2. Public Hearing and Adoption

The District held a public hearing on May 19, 2026 to hear public comments and consider adopting this 2025 RUWMP and the District's WSCP. As part of the public hearing, the District provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2025 RUWMP took place before the adoption of the Plan, which allowed the District the opportunity to modify the 2025 RUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

The District's adoption resolution for the 2025 RUWMP and WSCP is included in **Part 4, Appendix G-3.**

9.3. Plan Submittal

The District will submit the 2025 RUWMP and the District's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2025 RUWMP submittal to DWR will be done electronically through DWR's "Water Use Efficiency (WUE) Data Portal" website. The complete set of DWR Submittal Tables for the District is included in **Part 4, Appendix G-5**.

9.4. Public Availability

Within 30 days of submitting its Plan to DWR, the District will make the 2025 RUWMP and the District's WSCP available for public review. Copies will be accessible during normal business hours at the District's Office and posted on the District's website for public viewing.

9.5. Amending an Adopted UWMP or WSCP

If the adopted 2025 RUWMP or the District's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

10. References

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

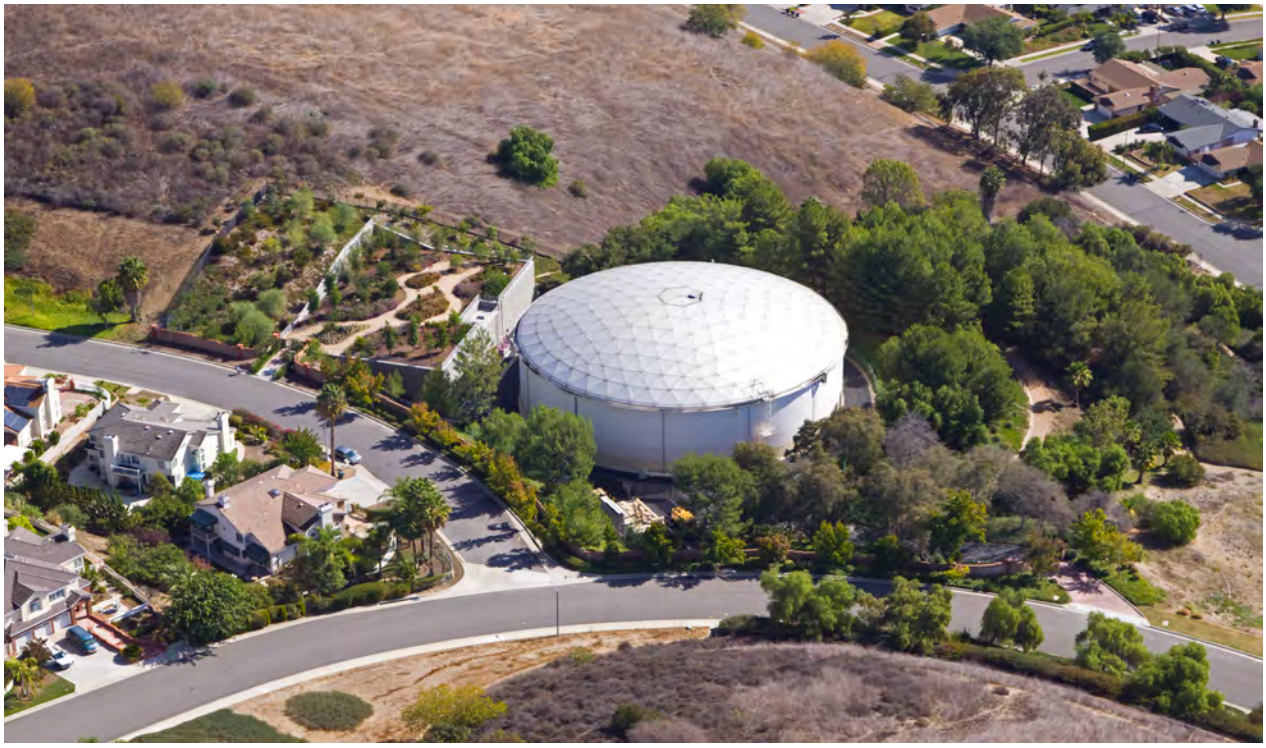
2025 Part 2: Local Agency Urban Water Management Plans

FINAL

2025 RUWMP

JUNE 2026

Part 2 Chapter 8: Walnut Valley Water District 2025 Urban Water Management Plan



Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

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Appendices

Part 4 of the 2025 RUMWP **Appendix H** contains Agency Supporting Information.

Acronyms and Abbreviations

Acronym	Description
AB1668	Assembly Bill 1668
AF	Acre-feet
AFY	acre-feet per year
AWWA	American Water Works Association
CII	commercial, industrial, and institutional
CRA	Colorado River Aqueduct
CWC	California Water Code
CWOL	Making Conservation a California Way of Life
CWOL	Making Conservation a California Way of Life Regulation
DCP	Drought Contingency Plan
DIM	Dedicated Irrigation Meters
District	Walnut Valley Water District
DMMs	Demand Management Measures
DRA	Drought Risk Assessment
DWR	Department of Water Resources
FY	Fiscal year
GIS	geographic information systems
GPCD	gallons per capita per day
gpmd	gallons per mile of pipe per day
gpscd	gallons per service connection per day
GRIP	Groundwater Reliability Improvement Program
GRIP+	Groundwater Reliability Improvement Program (Plus)
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
LACSD	Los Angeles County Sanitation Districts
LEF	Landscape Efficiency Factors
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
PHET	premium high-efficiency toilets
PWRP	Pomona Water Reclamation Plant
RHNA	Regional Housing Needs Assessment
RUWMP	Regional Urban Water Management Plan
SB X7-7	Senate Bill 7 of Special Extended Session 7
SB606	Senate Bill 606
SCAG	Southern California Association of Governments
SGMA	Sustainable Groundwater Management Act
SJCWRP	San Jose Creek Water Reclamation Plant
SWP	State Water Project
TVMWD	Three Valleys Municipal Water District

UWMP	Urban Water Management Plan
UWUO	Urban Water Use Objectives
WRMP	Water Resources Master Plan
WSCP	Water Shortage Contingency Plan

Individual UWMP

This chapter describes information specific to the Walnut Valley Water District (District), including its supplies, demands, and water use efficiency programs. The information and analysis provided in this chapter supplements the regional information presented in **Part 1** of the 2025 RUWMP and is provided to fulfill the District's reporting requirements for 2025 under the UWMP Act.

The regional analyses described in Part 1 (Regional Context) of the 2025 RUWMP were conducted using a consistent analytical framework, assumptions, and methodologies that are directly applicable to the District. The District relies on **Part 1** of the RUWMP for the lay description, regional water supply availability, and the underlying technical methodology used to evaluate water supply reliability under normal, single dry-year, multiple dry-year, and five-year drought stress-test conditions.

The water supply reliability assessment and Drought Risk Assessment (DRA) applicable to the District's Urban Water Management Plan (UWMP) are presented in plain language in **Part 1** of the 2025 RUWMP, specifically within **Chapter 5**.

Building upon that regional foundation, the District-specific supply and demand comparisons are presented in the tables within this UWMP. Unless otherwise noted, the conclusions of the regional water supply reliability assessment and DRA are directly applicable to the District and satisfy the requirements of the Urban Water Management Planning Act and the 2025 UWMP Guidebook. A completed DWR UWMP Compliance Checklist for the District is provided in **Part 4, Appendix H-1**.

1. System Description

This section describes the District's water system, service area, population demographics, local climate, and land uses.

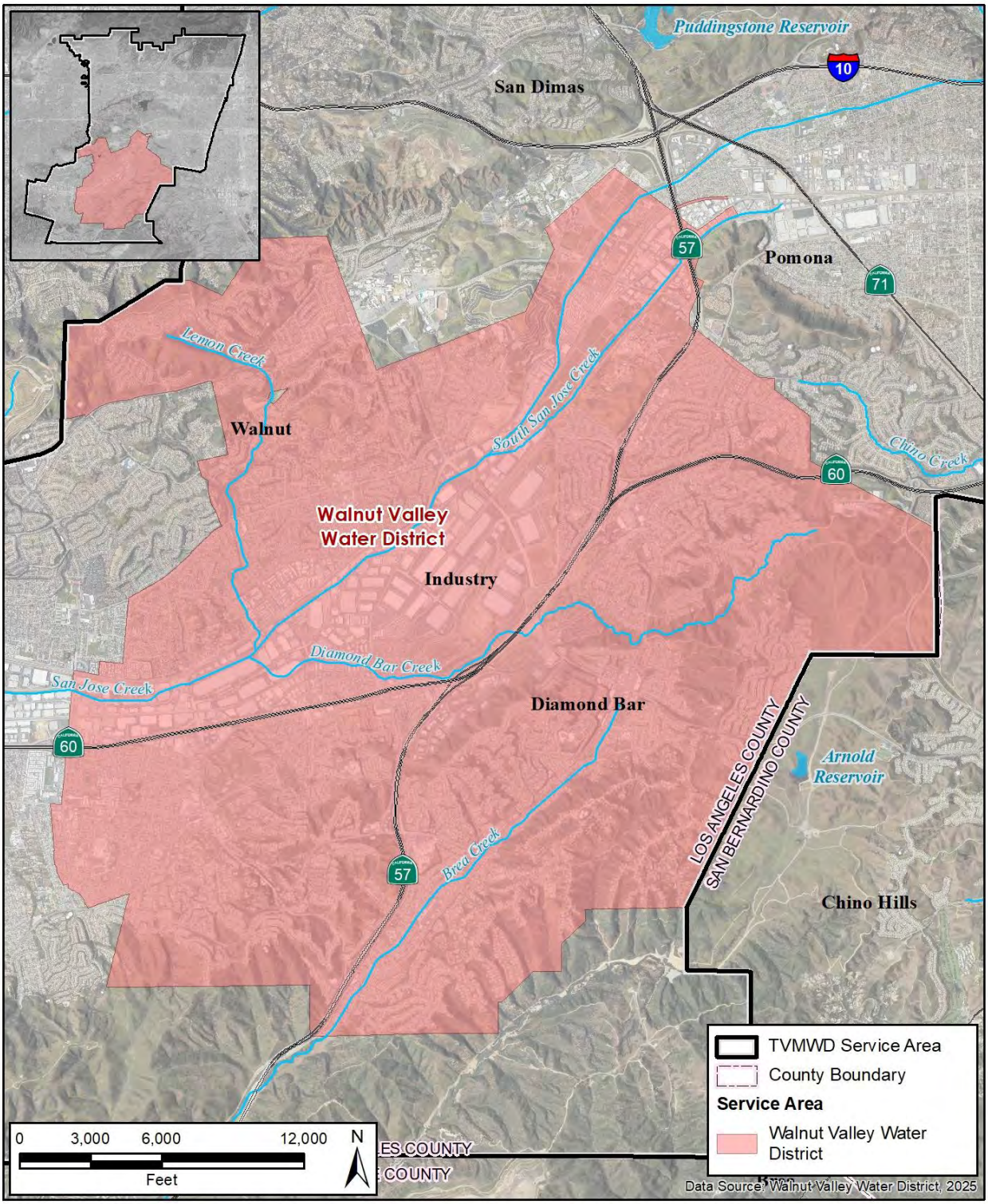
Walnut Valley Water District's service area is located approximately 20 miles east of the City of Los Angeles in the San Gabriel Valley. The District's service covers approximately 30.5 square miles encompassing the City of Diamond Bar and portions of the Cities of Industry, Pomona, Walnut, and West Covina, as well as unincorporated areas of Los Angeles County including Rowland Heights. The District's service area is primarily a residential area with most commercial and industrial uses located within the City of Industry. The District's service area is shown in **Figure 1-1**.

The District supplies water using both local groundwater and imported surface water, though groundwater is limited due to adjudication. As a result, the District relies heavily on imported water from the Colorado River and Northern California, delivered via the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD).

In 1955, the District, along with the City of Pomona and Rowland Water District, built the 7.6-mile Joint Water Line to transport treated imported water from MWD's Weymouth and TVMWD's Miramar treatment plants to the District's Biederman Reservoir and hydroelectric facilities. This pipeline served as the District's only water source until 1993, when the 5.5-mile Badillo/Grand Transmission Main was completed to improve reliability and provide an additional supply connection. The District also operates a 150-kW hydroelectric plant at the Joint Water Line connection, selling generated power to Southern California Edison.

To reduce reliance on imported potable water, the District operates a recycled water system for landscape irrigation at parks, schools, and other large irrigation sites. Recycled water is supplied by the Los Angeles County Sanitation Districts' Pomona Water Reclamation Plant.

Figure 1-1. Service Area



1.1. Service Area

The District is a retail public water supplier that meets the definition of an urban water supplier with 27,622 municipal water service connections in 2024. The regional climate, which includes the District's service area, is described in **Part 1, Chapter 2** of the 2025 RUWMP.

1.1.1. Population, Demographics, and Socioeconomics

Estimates of population served by the District are based on the 2020 U.S. Census Bureau and the Southern California Association of Governments (SCAG) (Southern California Association of Governments, 2024). A geographic information systems (GIS) analysis of 2020 Census data was used to determine the District's 2020 service area population, which was 95,080. The 2020 population and the number of residential connections served by the District in 2020 were used to derive a 2020 persons per residential connection factor of 3.5. This factor was then multiplied by the District's number of residential connections in 2025 to estimate the 2025 population served by the District. To project the population served by the District from 2030 to 2050, average annual population growth rates from SCAG projections were applied to this 2025 estimate. A GIS analysis of SCAG projection data was used to determine the SCAG growth rate specific to the District's service area. SCAG projected an increase in population from 2019 to 2035 averaging 0.26% per year and from 2035 to 2050 averaging 0.14% per year.

Estimated current and projected populations of the District's service area are included in **Table 1-1**.

Table 1-1. Current and Projected Population

Population Served	2025	2030	2035	2040	2045	2050
Total	95,645	96,894	98,143	98,630	99,117	99,604

The estimated 2025 and projected future number of households and employees within the service area were estimated using the same approach as population. SCAG projected an increase in households from 2019 to 2035 averaging 0.65% per year and from 2035 to 2050 averaging 0.17% per year. SCAG projected an increase in employment from 2019 to 2035 averaging 0.42% per year and from 2035 to 2050 averaging 0.07% per year. The estimated number of households and employees were determined by linear interpolation between SCAG projections for 2019, 2035, and 2050 as shown in **Table 1-2.**

Table 1-2. SCAG Household and Employment Projections for Water Service Area

Category	2025	2030	2035	2040	2045	2050
Households	31,309	32,318	33,326	33,614	33,902	34,189
Employees	46,313	47,279	48,245	48,409	48,572	48,735

The U.S. Census Bureau's QuickFacts program provides demographic information for incorporated cities with populations of 5,000 or greater. The District's service area includes the Cities of Diamond Bar, Industry, Walnut, and the unincorporated community of Rowland Heights. **Table 1-3** summarizes selected U.S. Census Bureau demographic data, such as income and race, for the three incorporated cities within the service area with populations exceeding 5,000.

Table 1-3. U.S. Census Bureau QuickFacts for Service Area

City	Income and Poverty (2024) Median Household Income	2024 Poverty Rate	Race & Origin White alone	Race & Origin Asian alone	Race & Origin Black alone	Race & Origin Hispanic	Race & Origin Two or More Races
City of Diamond Bar	$108,821	10%	14%	62%	3%	17%	11%
City of Walnut	$129,449	10%	11%	69%	2%	17%	8%
City of Rowland Heights	$85,617	12%	10%	61%	1%	29%	7%

Source: U.S. Census Bureau QuickFacts: United States (U.S. Census, 2024)

1.1.2. Land Use

Per the Fiscal Year (FY) 2024-2025 Three Valleys Municipal Water District Assessed Service Area by Land Use, the District's land use distribution by parcel count is as follows:

- Single-Family Residential: 78%
- Multi-Family Residential and Condominiums: 16%
- Mobile Homes: <1%
- Commercial: 2%
- Churches: <1%
- Industrial: 1%
- Vacant Residential: 2%
- Vacant Non-Residential: <1%

2. Water Use

This section describes the current and projected water uses within the District's service area.

2.1. Water Use by Sector

2.1.1. Water Use Sectors Listed in Water Code

Water suppliers are required to identify water uses, to the extent that records are available, for at least each of the water use sectors identified in CWC 10631(d) to assist in the water demand projections. The District primarily serves potable water to customers, though it does supply a small amount of recycled water. Recycled water uses are described in **Section 4.5.**

The District serves the following water uses:

Single Family Residential

Single family residential customers are typically on a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling.

Multi-Family Residential

Multi-family residential customers are typically multiple dwelling units within one building or several buildings within one complex.

Commercial

Commercial customers typically provide or distribute a product or service.

Government

Institutional water customers are typically public services, such as higher-education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

Industrial

Industrial customers typically manufacture or process materials.

Landscape Irrigation

The District tracks the water use for landscape irrigation.

Losses

Distribution system water losses are the water losses from the point of water entry to the distribution system to the delivery point to the customer's system. Water losses are discussed in **Section 2.1.3**.

The number of active connections is shown in **Table 2-1**.

Table 2-1. Fiscal Year 2021-2025 Connections by Customer Class

Customer Class	2021	2022	2023	2024	2025
Residential – Single Family	25,479	25,486	25,497	25,510	25,604
Residential – Multi-Family	175	175	175	178	178
Government	386	386	398	399	400
Industrial	343	344	344	355	356
Commercial	1,038	1,039	1,036	1,028	1,033
Wholesale	10	11	10	21	21
Water District Meter	29	29	30	30	30
Total	**27,460**	**27,470**	**27,490**	**27,521**	**27,622**

2.1.2. Past and Current Water Use

The District serves potable water for a variety of uses, as summarized in **Table 2-2**. Over the past five years, the District served an average of 14,701 AFY of potable water. In 2025, 82% of the total potable water deliveries were to residential customers (71% to single-family accounts and 12% to multi-family accounts). **Table 2-2** shows the annual volume of potable water used by each customer class for 2025. Recycled water uses are described in **Section 4.5.**

Table 2-2. DWR 4-1R Actual Demands for Water, 2025, AFY

Use Type	Potable or Non-Potable (*optional)*	2025 Volume
Single Family	Potable	10,278
Multi-Family	Potable	1,676
Commercial	Potable	1,174
Industrial	Potable	163
Institutional	Potable	276
Landscape	Potable	937
Distribution Water System Losses	Potable	1,167
	Total	**15,671**

2.1.3. Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the point of water entry to the distribution system to the point of delivery to the customer's system. Water loss can result from aging infrastructure, leaks, seepage, theft, metering inaccuracies, data handling errors, and other causes. Addressing water losses can increase water supplies and recover revenue. The District monitors its water loss and prepares an annual American Water Works Association (AWWA) Water Audit to estimate the volume of water loss. The District has submitted all required water loss audits to the State, as shown in **Table 2-3**. Copies of the City's recent AWWA audits are provided in **Part 4, Appendix H-6**.

Table 2-3. DWR 4-5R Month Water Loss Audit Reporting

Public Water System ID # Reported in DWR Table 2-1R	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910234	2020	Yes
	2021	Yes
	2022	Yes
	2023	Yes
	2024	Yes

DWR Notes:
2020 AWWA: WalnutValleyWD_CY2020_v2.xlsx
2021 AWWA: WalnutValleyWD_CY2021_v2.xlsx
2022 AWWA: CY2022_CA1910234_L1V.xlsx
2023 AWWA: CA1910234_CY23_v2.xlsx
2024 AWWA: CA1910234-the District_CY2024-L1V.xlsx

CWC Section 10608.34 required the State Water Resources Control Board (State Board) to develop water loss performance standards for urban retail water suppliers to minimize water waste through system leaks. Water loss performance standards were developed through a rulemaking that became effective in 2023. Under the regulations, each supplier will be required to comply, by 2028, with an individualized volumetric water loss standard based on real loss, using the economic model developed by the State Board and the supplier's own unique data. Real loss is the physical loss of water from water distribution systems, as opposed to apparent losses, which are revenue losses due to meter inaccuracies, billing errors or unauthorized consumption. A supplier's baseline water loss is calculated as the average water loss from at least 3 of the 4 water loss audits from 2017 – 2020. The real water loss performance standard is based on gallons per service connection per day (gpscd), or gallons per mile of pipe per day (gpmd), depending on how the supplier reports real loss. Post-2028 compliance with volumetric water loss standards will be assessed every three years based on the average of the supplier's real loss from the preceding three years, with an allowed variation of 5 gallons per connection per day above the supplier's water loss standard. Apparent loss standards are equal to the baseline apparent loss and compliance is evaluated at the same time as compliance with the Real Water Loss Performance Standard.

Although the compliance period has not yet started, CWC Section 10631 (d)(3)(C) requires water suppliers to provide data in the UWMP to show whether the supplier met its State Board water loss performance standard.

Over the last five years, the District water losses have ranged from 5% to 8% when calculated as the difference between billed consumption and total production. To project the water loss component of future demands, the District assumed future water losses will be an average of 11% . Calculated water losses are shown in **Table 2-4**.

Based on data released by the State on January 30, 2026, the District's baseline real water loss is 26.8 gpscd and the real water loss standard is 26.8 gpscd, and the apparent loss standard is the baseline of 4.9 gpscd. As shown in **Table 2-5**, based on the most recent water loss audit from 2024, the District not yet met the real water loss performance standard, but is working toward that goal by 2028. **Section 8.1.5** discusses District's programs to assess and manage distribution system real loss.

Table 2-4. Calculated Water Loss

Water Loss	2021	2022	2023	2024	2025
Calculated Water Loss	901	885	883	1,113	1,167
% Water Loss	5%	5%	6%	8%	7%

Table 2-5. DWR 4-6R Progress Towards 2028 Water Loss Standard

Public System ID # Reported in Submittal Table 2-1R	Did the Water Board Calculate a Water Loss Standard for this Public System?	2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Standard	Number of Units	Volume of Total Real Water Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Real Water Loss per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit)	2025 or Most Recent Year Apparent Water Loss per Unit per Day
CA1910234	Yes	26.8	gpscd	27,765	1,117	35.9	4.9	gpscd	27,765	110	3.5

2.2. Projected Water Use

The "Making Conservation a California Way of Life" Regulation (CWOL Regulation) establishes unique water budget-based Urban Water Use Objectives (UWUO) for each urban retail water supplier in the State. The CWOL Regulation requires suppliers to calculate an annual UWUO consisting of these core components:

> UWUO = Residential Indoor Water Use Budget + Residential Outdoor Water Use Budget + Commercial, Industrial, and Institutional (CII) Dedicated Irrigation Meters (DIM) Outdoor Water Use Budget + Real Water Loss Budget

Each component has associated water efficiency standards that become increasingly stringent through 2040 as shown in **Table 2-6**. The key standards are residential indoor GPCD, Landscape Efficiency Factors (LEF), and real water loss measured in gallons per service connection per day. Annually updated supplier-specific input data is also required for population, climate, landscapes, and real water losses. The UWUO does not include some uses, such as CII indoor use or other uses that are considered "Excluded Demands".

Table 2-6. Water Efficiency Standard by Reporting Period

Year	Residential Indoor GPCD	Residential Outdoor LEF	CII DIMs	Real Water Loss Budget[1]
FY 23/24	55	0.8	Actual Reported "Landscape" Volume	Actual Reported or Budget
FY 25/26	47	0.8	Actual Reported "Landscape" Volume	Actual Reported or Budget
FY 30/31	42	0.8	0.8 LEF (starts July 1, 2028)	Budget (starts July 1, 2027)
FY 35/36	42	0.63	0.63 LEF	Budget
FY 40/41	42	0.55	0.45 LEF	Budget

Notes:
1. Budget = Supplier standard for real water loss (gallons per service connection per day) applied to total service connections

DWR and the State Board have developed an annual reporting framework, tools, and guidance for calculating the UWUO and comparing it to the actual use for that year. The State Board's "Water Use Objective Exploration Tool" allows users to enter varying efficiency standards and baseline year(s) of input data to calculate and visualize a comparison of historic demand to the UWUO with selected standards. The State Board's "Annual UWUO and Water Use Report" tool pre-populates input data and standards for the given reporting year. To project demands for this UWMP, a demand tool that aligns with the framework, data, and calculations of the State Board's tools was used and expanded to allow for forecasting future years' water demand considering future efficiency standards, supplier input data, and growth assumptions.

Supplier input data and growth assumptions used in this UWMP for future years are shown in **Table 2-7**. Projected growth for residential indoor usage is associated with population projections described in **Section 1.1.1**. Residential landscape area growth is associated with connections growth scaled with SCAG's housing projections described in **Section 1.1.1**. The historic landscape area provided by the State

in its UWUO tools was divided by the 2025 residential service connections to create a landscape area per connection factor that was applied to future connections to account for growth. CII DIM Landscape connections were assumed to scale with SCAG's employee projections described in **Section 2.2**. Excluded demand growth was assumed to scale with the ratio of historic Excluded Demand to the UWUO applied to future UWUO estimates. The Real water loss standard is applied to the sum of all projected future connections.

Table 2-7. UWUO Components Growth Assumptions

UWUO Component	Supplier Input Data	Input Data for Growth	Associated Assumption
Residential Indoor	Population	2025-2050 population	See **Section 1.1.1**.
Residential Landscape	Landscape area & annual climate data	2025 Irrigable Irrigated Residential Landscape Area per Service Connection scaled to future connections.	SCAG household projections growth rate applied to connections. Historic average climate data from the State is used for future years.
CII DIM Landscape	Water use	Historic Landscape water use per service connection scaled to future connections.	SCAG employees annual growth rate applied to "Landscape" connections.
Real Water Loss	Connections	Supplier standard for Real Water Loss (gallons per service connection per day) applied to future total connections.	Sum of future connections including UWUO & Excluded Demand categories connections.
Excluded Demand (not included in UWUO but included in total demand)	Water use		Ratio of historic Excluded Demand to UWUO applied to future UWUO estimates.

Future efficiency standards (see **Table 2-6)** were applied to existing customer residential population, residential landscaped area, CII landscape usage, and total connections. These demand components for existing customers are shown to reduce over time as the standards become more stringent. Excluded demands were assumed to grow at the ratio of historic Excluded Demand to the UWUO. The most stringent standards in **Table 2-6** for FY 40/41 were applied to all new growth connections for all time periods, recognizing that new construction will comply with efficient building codes. The resulting projected UWUO, excluded demands, and total demands for both existing and new growth connections are shown in **Table 2-8** and **Figure 2-1**. **Table 2-8** presents projected demands by customer type through 2050.

Table 2-8. UWUO Projections by Component, AFY

Category	2030	2035	2040	2045	2050
Existing- Residential Indoor	4,500	4,500	4,512	4,500	4,500
Existing- Residential Outdoor	5,670	4,519	3,978	3,978	3,978
Existing- CII DIM	937	738	527	527	527
Existing- Real Water Losses	815	815	817	815	815
Existing- Future Total UWUO Demand Target	11,922	10,572	9,834	9,820	9,820
Existing- Excluded Demands	1,964	1,964	1,964	1,964	1,964
Existing- Total Demand	13,886	12,536	11,798	11,784	11,784
New- Residential Indoor	59	118	141	163	178
New- Residential Outdoor	139	260	294	328	358
New- CII DIM	11	22	24	26	28
New- Real Water Losses	57	64	71	78	86
New- Total UWUO Demand	265	463	530	596	649
New- Excluded Demands	67	116	133	149	163
New- Total Demand	332	579	663	745	812
Existing & New- Total UWUO Demand	12,187	11,035	10,364	10,415	10,469
Existing & New- Excluded Demands	2,031	2,080	2,097	2,114	2,127
Existing & New- Total Demand	14,218	13,115	12,461	12,529	12,596

Figure 2-1. UWUO Projections by Component, AFY

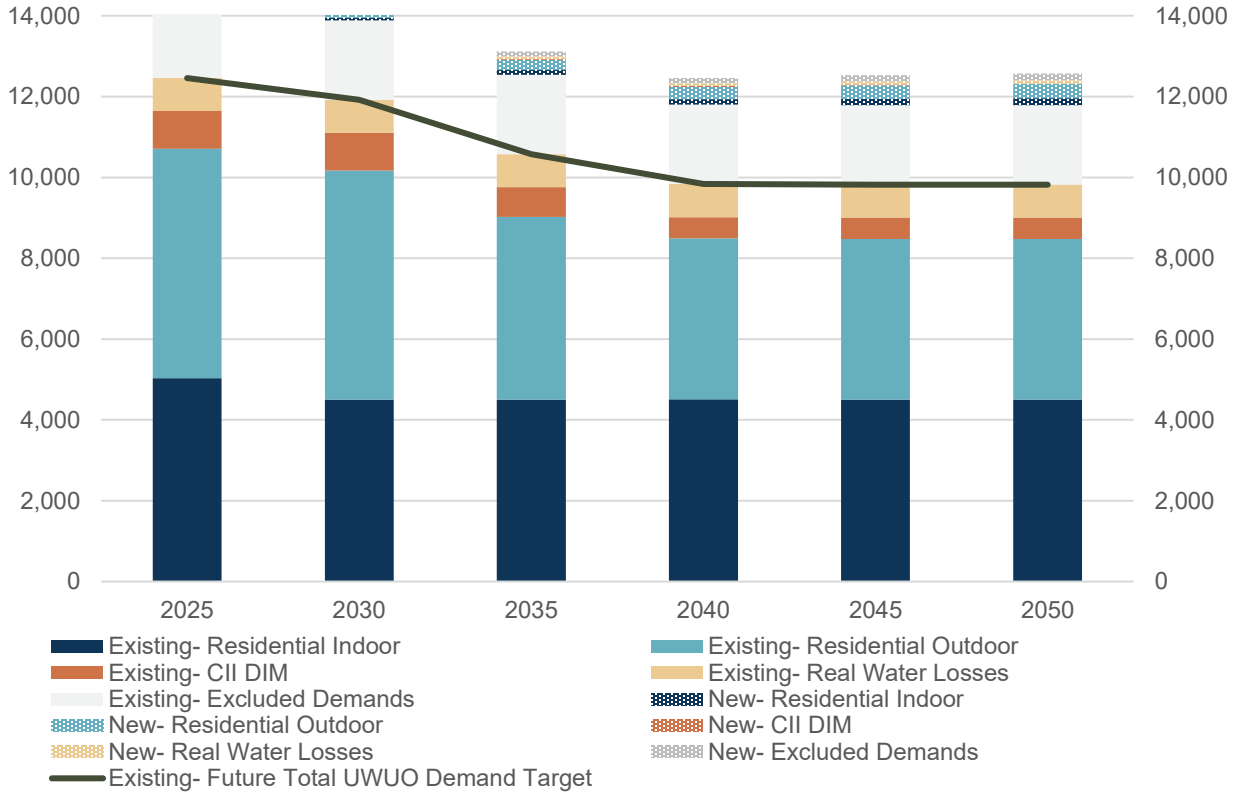


Table 2-9. DWR 4-2R Projected Demands for Potable Water, AFY

Use Type	Additional Description	Level of Treatment When Delivered	Projected Water Use 2030	Projected Water Use 2035	Projected Water Use 2040	Projected Water Use 2045	Projected Water Use 2050
Single Family		Potable	8,947	8,109	7,702	7,740	7,778
Multi-Family		Potable	1,421	1,288	1,223	1,229	1,235
Commercial		Potable	1,126	1,149	1,153	1,156	954
Industrial		Potable	191	195	195	196	162
Institutional		Potable	254	259	260	261	215
Landscape		Potable	948	760	551	553	555
Distribution System Water Losses		Potable	1,332	1,357	1,378	1,394	1,696
		Total	**14,218**	**13,115**	**12,461**	**12,529**	**12,596**

Table 2-8, Table 2-9, and **Table 2-10** satisfy the requirement to include anticipated water conservation savings when developing future demand projections since they account for water efficiency standards set by the State for the UWUO. Conservation savings were considered and included in developing demand estimates for the next 25 years. However, the District considers projected demand to plan for supply reliability if demands continue in alignment with historic patterns rather than in alignment with new water use efficiency standards. The District is complying with and planning for new water use efficiency standards as described in **Sections 3** and **8.**

Senate Bill 1087 requires that water use projections in an UWMP include projected water use associated with single family and multi-family residential housing for lower income households, as identified in the housing elements of any city, county, or city and county within the supplier's service area. The Regional Housing Needs Assessment (RHNA) establishes housing needs for each jurisdiction over the applicable planning period. SCAG adopted the 6th Cycle RHNA Allocation Plan, which covers the planning period from October 2021 through October 2029 (SCAG, March 2021). SCAG's population and household projections inform the RHNA Allocation Plan and are used in the determination and allocation of housing needs, including lower income housing, for individual jurisdictions. The growth projections in this UWMP are based on SCAG projections for the service area and therefore also incorporate the lower income housing projections. The projected demands in this UWMP represent water use from all future growth and are inclusive of water use for lower income households.

Table 2-10. DWR 4-3R Inclusion in Water Use Projections

Question	Yes or No
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included in Projections?	Yes

2.3. Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. A recent Climate Change Vulnerability Assessment utilizing data from DWR and 20 global climate models suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** of the 2025 RUWMP includes an assessment of the potential impacts of climate change.

3. SB X7-7 Compliance & Future Water Use Efficiency Requirements

This section describes compliance with the Water Conservation Act of 2009, also known as Senate Bill 7 of Special Extended Session 7 (SBX7-7). The section demonstrates compliance with the 2020 SBX7-7 target and discusses future water use efficiency requirements.

3.1. Compliance and Future Water Use Efficiency Requirements

SBX7-7 was incorporated into the UWMP Act in 2009 and required that all water suppliers increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20% by the year 2020.

SBX7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that water suppliers could use to establish their baseline water use and determine their water conservation targets. SBX7-7 and DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, March 2021) specify methodologies for determining the baseline water demand, 2015 interim urban water use target, and the 2020 urban water use target for the District as described in the 2020 UWMP. This section also demonstrates that the District achieved its 2020 water use target.

Table 3-1 below establishes the District's 2020 actual and 2020 target GPCD. As shown, the District met its 2020 target. Most recently, in 2025, the water use was 146 GPCD, which is well below the 2020 target of 169 GPCD.

Table 3-1. SB X7-7 2020 Target Progress

2020 Target GPCD	2020 Actual GPCD	Did Supplier Achieve Target?
169	149	Yes

New water use efficiency standards from the "Making Conservation a California Way of life Regulation" (CWOL Regulation) supersede SBX7-7 standards. In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB1668, Friedman) and Senate Bill 606 (SB606, Hertzberg), collectively referred to as the "2018 Water Conservation Legislation." Based on the 2018 Water Conservation Legislation, related legislation, and subsequent adoption of the CWOL Regulation, each urban retail water supplier must comply with its UWUO. DWR and the State Water Resources Control Board (State Board) have developed a reporting framework for calculating the UWUO and compliance annually with efficiency standards becoming increasingly stringent through 2040.

The demand projections in this UWMP are based on the District meeting its estimated future UWUO, as described in **Section 2.2** in order to plan and implement necessary demand management measures (described in **Section 8**) to support meeting the UWUO. DMMs and UWUO compliance planning enhance resiliency for drought and other water shortage conditions as described in **Sections 5, 7,** and **8**.

4. Water Supply

The District utilizes three primary sources for water supply: treated and untreated imported surface water purchased from the MWD through TVMWD, groundwater pumped from the Puente Basin and Spadra Basin, and recycled water purchased from the Los Angeles County Sanitation Districts (LACSD). The District will also begin purchasing treated groundwater from the Main Basin produced by California Domestic Water Company (CDWC). The District's main source of water supply is treated imported surface water.

4.1. Purchased or Imported Water

4.1.1. Three Valleys Municipal Water District

The District purchases treated, imported water from MWD through TVMWD. MWD imports water from the Colorado River through the Colorado River Aqueduct (CRA), owned and operated by MWD, and the State Water Project (SWP), which utilizes the California Aqueduct for transmission to Southern California. Water delivered to TVMWD's sub-agencies can receive treated imported water from MWD's Weymouth Treatment Plant located in the City of La Verne or from TVMWD's Miramar Water Treatment Plant located in the City of Claremont.

The District's treated imported water supplies from MWD, through TVMWD, may be impacted during a multi-year drought or other conditions which limits MWD from delivering sufficient water supplies to all its member agencies, and consequently to the District. A description of this supply and its reliability is provided in **Part 1 Chapter 3** and **Chapter 5** of the 2025 RUWMP.

4.1.2. Purchased Water from California Domestic Water Company

The District can purchase treated groundwater produced by CDWC. The District and Rowland Water District (through the Puente Basin Water Agency) entered into a "Water Storage and Export Agreement" with California Domestic Water Company in July 2015. The agreement allows for the delivery of up to approximately 5,000 AFY of potable water from the Main San Gabriel Basin to the District and Rowland Water District. Pursuant to the agreement, CDWC began delivering water to Rowland Water District during FY 2016-17. In order to maximize production, the Pathfinder Pipeline was constructed and will enable the transmission of water from CDWC into the District's distribution system. Although the District does not directly pump from the Main Basin for potable supplies, a discussion regarding groundwater supplies from the Main Basin is provided in **Section 4.2**. Because the Pathfinder Pipeline was only recently constructed, the District has not purchased water (treated Main Basin groundwater) from CDWC over the past five years.

Purchased Water from Main San Gabriel Basin

The District can also purchase treated groundwater from the Main San Gabriel Basin that is produced by CDWC. The basin Watermaster manages the basin through an Operating Safe Yield (OSY), which is

determined annually based on groundwater elevations and rainfall. More information on the Main San Gabriel Basin's adjudication and management is presented in **Part 1, Chapter 3** of the RUWMP.

CDWC's share of the OSY is 6.25547%. Over the past five years, the District has not purchased any treated groundwater from the Main Basin.

4.2. Groundwater

The District can extract groundwater from two regional groundwater basins: Puente Basin, and Spadra Basin. Puente Basin has been adjudicated while Spadra Basin is un-adjudicated, as discussed further in **Part 1 Chapter 3** of the RUWMP.

4.2.1. Puente Basin

Groundwater from the Puente Basin is used for non-potable purposes, including irrigation through the District's recycled water distribution system. The recycled water system (including Puente Basin water) is used by the District as a replacement to potable water supplies.

The Puente Basin is actively managed by the Puente Basin Watermaster. The adjudicated water rights in the Puente Basin are 4,400 AF. Through adoption of an annual OSY, the Puente Basin Watermaster has the ability to reduce the amount of water rights available to Producers. According to the Puente Basin Watermaster 39th Annual Report, the Watermaster adopted an OSY of 2,506 acre-feet and estimated each of the subsequent four years to be 2,506 acre-feet.

On an annual basis, Pumpers are allocated a Share of the Operating Safe Yield and Return Flow Credits. Should a Pumper not produce its full entitlement, the Judgment allows for the portion not pumped to be used in the following (first) year. These rights are termed Carry-over Rights. However, unproduced Carry-over Rights cannot be carried beyond one year and are lost, thus becoming Lost Carry-over. For the Puente Basin, a total of 2,360.8 acre-feet were carried over from Fiscal Year 2024-2025 to Fiscal Year 2025-26. The District's share of the OSY for FY 2025-26 is 550 AF.

4.2.2. Spadra Basin

Groundwater from the Spadra Basin is used for non-potable purposes, including irrigation as part of the District's recycled water distribution system. The recycled water system (including Spadra Basin groundwater) is used by the District as a replacement to potable water supplies.

Table 4-1 summarizes the District's actual groundwater production over the past five years. Pumping volumes fluctuate annually based on total system demand, the availability of surface water, and local hydrological conditions.

Table 4-1. DWR 6-1R Groundwater Pumped Last Five Years (AF)

Groundwater Type	Location or Basin Name	2021	2022	2023	2024	2025
Alluvial Basin	Puente Basin	1,000	721	426	439	1,556
Alluvial Basin	Spadra Basin	86	61	36	36	129
	Total	**1,086**	**782**	**462**	**475**	**1,685**

4.3. Surface Water

The District does not use surface water supplies to meet its water demands.

4.4. Stormwater

The District does not directly use stormwater to meet its water demands.

4.5. Wastewater and Recycled Water

Wastewater generated by the District is collected within the District's local sewer collection system and treated by LACSD. The District's local sewers tie into one of LACSD's regional trunk sewers. The regional trunk sewer lines deliver wastewater to the San Jose Creek Water Reclamation Plant (SJCWRP) and the A.K. Warren Water Resource Facility (formerly known as the Joint Water Pollution Control Plant); however, the percentage breakdown between these two plants in treating the District's wastewater is unknown. The water reclamation plants are not located within the District's service area.

To align with current conservation realities and CWOL framework, wastewater generation is estimated utilizing the State's 2025 indoor residential water use standard of 47 GPCD (as indoor water use serves as the direct proxy for wastewater generation). Based on the District's 2025 population of 95,645, the estimated amount of wastewater collected by the District is approximately 4.50 MGD (about 5,035 AFY). **Table 4-2** shows existing wastewater collection and treatment at LACSD.

4.5.1. Potential, Current, and Projected Recycled Water Uses

The District uses recycled water for landscape irrigation, including nurseries, golf courses, roadside irrigation, parks, schools, greenbelts, and maintenance districts. The District plans to increase recycled water use within its service area by expanding the recycled water system to additional landscape irrigation areas not currently using recycled water. The District primarily receives recycled water supplies from the LACSD's Pomona Water Reclamation Plant (PWRP). The District also uses untreated groundwater from Puente Basin and Spadra Basin to meet recycled water demand.

Future recycled water use projections are based on current recycled water use and planned recycled water projects. The amount of untreated non-potable groundwater from the Puente Basin and Spadra Basin used to augment the system was excluded from the recycled water volume delivered to each customer.

Because the District is reliant on imported water supplied from TVMWD, the economic value of a recycled water system continues to increase. Any additional recycled water supplies that can offset imported water purchases will make these projects more viable.

The District's 2020 UWMP projected recycled water use in 2025 to be 3,489 AF. The District's recycled water use in 2025 was 2,362 AF.

Table 4-2. DWR 6-2R Wastewater Collected within Service Area in 2025 (AF)

Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Volume of Wastewater Collected from UWMP Service Area 2025**	**Name of Wastewater Treatment Plant (WWTP) and Place ID Number**	**Is WWTP Located Within UWMP Area?**
LACSD	Estimated	5,035	Pomona Water Reclamation Plant (Place ID 250700)	No
	Total	**5,035**		

4.6. Water Exchanges and Transfers

As mentioned in **Section 4.1**, the Water Production and Delivery agreement with the District and Rowland Water District with the CDWC allows for the delivery of up to approximately 5,000 AFY of potable water from the Main Basin. The District's share of annual deliveries is expected to be 2,500 AF. Pursuant to the terms of the Storage and Export Agreement signed on July 1, 2015 and approved on September 4, 2015 between Puente Basin Watermaster (the District and Rowland Water District) and the Main Basin Watermaster, up to 30,000 AF of imported surface water can be stored in the Main Basin in advance of, and in exchange for, groundwater which is produced and sold to the District by CDWC. Approximately 22,166 AF of water is currently stored by Rowland Water District and the District in the Main Basin.

The District does not have any current or planned transfer opportunities.

4.7. Future Water Projects

As part of the TVMWD Water Resources Master Plan (WRMP) and Drought Contingency Plan (DCP) with the member agencies, the District is currently pursuing several projects to increase water supply reliability. Future projects include:

- Six Basins Groundwater Project – the District in partnership with Rowland Water District, has entered into a project agreement through Puente Basin Water Agency to jointly develop new extraction wells. This project is expected to increase overall supply by approximately 1,500 AF.
- Covina Irrigating Company Interconnection – the District in partnership with Rowland Water District, has entered into a project agreement through Puente Basin Water Agency to jointly improve system interties. This project is expected to increase overall supply by approximately 2,000 AF.
- Spadra Basin Optimization Scenario 3 – the District in partnership with the City of Pomona, has entered into a project agreement through Spadra Basin Groundwater Sustainability Agency (GSA) to jointly improve system interties. This project is expected to increase overall supply by approximately 3,500 AF.

Four regional water supply projects were also identified in the WRMP and DCP effort through collaboration with TVMWD, member agencies, and regional stakeholders. These regional projects, described in **Part 1, Chapter 3**, are intended to enhance overall supply reliability for the region.

- Project 1: External Partnership with Covina Valley Water Company – Main Basin
- Project 2: TVMWD Groundwater Reliability Improvement Program (GRIP)
- Project 3: TVMWD Storing Water in Main San Gabriel Basin (GRIP+)
- Project 4: TVMWD–Pomona Chino Basin Conjunctive Use Exchange

As development progresses and increased demands are placed on the system, the District will determine which projects to implement.

4.8. Summary of Existing and Planned Sources of Water

The District's water supply is comprised of treated imported water, groundwater, and recycled water. The volume of water utilized from each source in 2025 is summarized in **Table 4-3,** and projected supply is summarized in **Table 4-4**.

Table 4-3. DWR 6-8R Actual Water Supplies in 2025 (AF)

Water Supply	Additional Detail on Water Supply	2025 Actual Volume	2025 Potable or Non-Potable (optional)	2025 Total Entitlement (optional)
Groundwater (not desalinated)	Puente Basin	1,556	Non-Potable	
Groundwater (not desalinated)	Spadra Basin	129	Non-Potable	
Purchased or Imported Water	Metropolitan Water District – TVMWD	15,671	Potable	
Recycled Water	Pomona Water Treatment Plant	677	Non-Potable	
	Total – Potable	**15,671**		
	Total – Non-Potable	**2,362**		
	Total – All	**18,033**		**-**

Supply Projection Methodology

To project future water supplies accurately and conservatively, the District, in coordination with TVMWD, evaluated supply projection methodologies. Rather than projecting supplies based on maximum legal entitlements or absolute physical extraction capacity, the District opted to utilize a "Real Water" (Utilization-Based) approach. This approach grounds future projections in empirical operational reality. The methodology utilized a baseline representing the District's average local supply utilization over the most recent five-year period (2021–2025), which was 17,843 acre-feet per year (AFY). This baseline smoothed out historically dry years (e.g., 2021) and historically wet years (e.g., 2023).

As described in **Part 1, Section 5.1.2**, to calculate the projected supplies shown in **Table 4-4**, the following steps were applied:

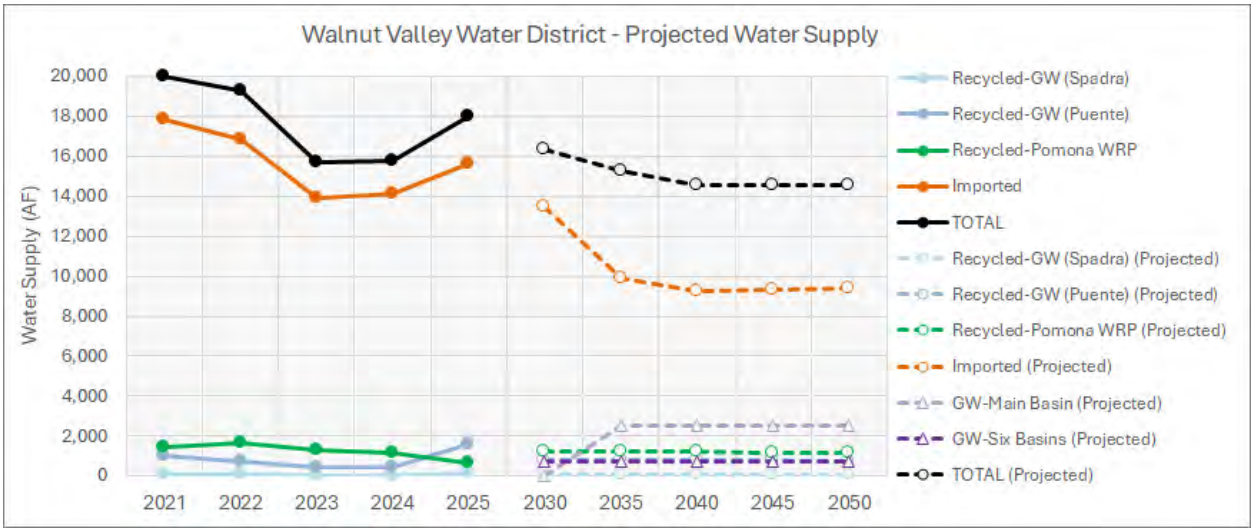
1. **Climate Change Adjustments:** Specific climate change vulnerability factors, derived from TVMWD's 2024 Climate Vulnerability Analysis, were applied to the 2021–2025 baseline local agency supplies (such as Puente Basin and Spadra Basin groundwater) to forecast anticipated local yields through 2050. Recycled water projections were incorporated based on system capacity and historical averages.
2. **Integration of Future Local Projects:** As detailed in Section 4.7, the projections incorporate the planned activation of new local supplies, including the Six Basins Groundwater Project (anticipated to begin yielding supply by 2030) and the Central Basin supply (anticipated to begin yielding supply by 2035).
3. **Imported Water Reliance:** The projected local groundwater and recycled supplies were then compared against the District's projected demand. Any projected unmet demand is assumed to be fulfilled by imported water purchases from MWD through TVMWD.

As shown in **Table 4-4** and **Figure 4-1**, the District's reliance on imported MWD water is projected to decrease significantly over time as new local groundwater projects in the Six Basins and Main Basin come online, effectively diversifying the portfolio and enhancing local reliability.

Table 4-4. DWR 6-9R Projected Water Supplies (AF)

Water Supply	Additional Detail on Water Supply	2030	2035	2040	2045	2050
Groundwater (not desalinated)	Spadra Basin	70	69	68	67	64
Groundwater (not desalinated)	Puente Basin	833	826	812	792	765
Purchased or Imported Water	TVMWD/MWD	13,518	9,915	9,261	9,329	9,396
Purchased or Imported Water	Main Basin	0	2,500	2,500	2,500	2,500
Purchased or Imported Water	Six Basins	700	700	700	700	700
Recycled Water	Pomona Water Reclamation Plant	1,249	1,236	1,217	1,193	1,163
	Total – Potable	**14,218**	**13,115**	**12,461**	**12,529**	**12,596**
	Total – Non-Potable	**2,151**	**2,131**	**2,098**	**2,051**	**1,993**
	Total – All	**16,369**	**15,246**	**14,559**	**14,580**	**14,589**

Figure 4-1. Walnut Valley Water District Projected Supply and Demand Comparison (AF)



4.9. Energy Intensity of Water Supplies

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.

- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2025, the District consumed 318 KWH of energy for water facilities per AF of water delivered.

5. Water Service Reliability Assessment

This section considers the District's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from the District's current source of supply through 2050.

5.1. Constraints on Water Sources

While the District maintains a highly reliable water portfolio, its supply sources are subject to various environmental, regulatory, and infrastructural constraints. A comprehensive analysis of regional water supply constraints is provided in **Part 1, Chapter 3** and **Part 1, Chapter 5** of the 2025 RUWMP.

For the District specifically, the primary constraints on water sources include:

- **High Reliance on Imported Water:** Historically, the District has been heavily reliant on imported water supplies from MWD through TVMWD to meet the vast majority of its potable demands. During severe multi-year droughts when State Water Project (SWP) and Colorado River allocations are reduced by the State, the District faces potential constraints on imported volumes. To proactively mitigate this, the District is actively diversifying its portfolio through aggressive local supply development, including the planned integration of Main Basin water (via CDWC), Six Basins groundwater, and Spadra Basin supplies.
- **Infrastructure and Interconnection Capacity:** Transitioning from a heavily imported water portfolio to a diversified portfolio utilizing multiple local groundwater basins requires significant capital infrastructure. As identified in **Section 4.7**, the District must construct new extraction wells, pipeline upgrades, and system interconnections (e.g., the Covina Irrigating Company Interconnection and Spadra Basin Optimization) to ensure these new local supplies can be reliably extracted and distributed.
- **Climate Change Impacts on Surface Water:** As identified in **Part 1, Section 2.5**, climate-driven volatility, including shorter rainy seasons and prolonged dry periods, impacts the natural replenishment of local groundwater basins and the long-term availability of imported supplies. This constraint underscores the importance of the District's highly climate-resilient recycled water system, which reliably offsets potable demand for irrigation and industrial uses regardless of local hydrology.

5.2. Year Type Characterization

In general, groundwater and recycled water are less vulnerable to seasonal and climatic changes than imported surface water supplies. The respective Watermasters and Groundwater Sustainability Agencies for the Puente, Spadra, Main, and Six Basins actively monitor groundwater levels and implement management strategies to maintain the long-term sustainability of local groundwater sources. Recycled

water, which makes up an integral portion of the District's portfolio, is highly resilient to drought. Further discussion of regional water resource management is included in **Part 1 Chapter 3** of the RUWMP.

Per UWMP requirements, the District has evaluated reliability for an average year, single dry year, and a five consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** This condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** The single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** The driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

To characterize these year types, the District evaluated historical supply and demand data. For the purposes of this 2025 UWMP, the District established a "Normal Year" baseline using the average annual supply and demand from 2021 through 2025.

Because water demand in the District typically increases during dry years due to elevated outdoor irrigation needs, the "Single Dry Year" and "Five-Year Drought" scenarios are modeled using historical years where production peaked to meet elevated drought demands. **Table 5-1** summarizes the base years utilized for this analysis and the corresponding volume of water available/utilized as a percentage of the average year.

Table 5-1. DWR 7-1R Basis of Water Year Data

Year Type	Base Year (FY)	Volume Available (AF)	% of Average Supply
Average Year	2021-2025	17,843	100%
Single-Dry Year	2021	20,409	114%
Consecutive Dry Years 1st Year	2018	21,043	118%
Consecutive Dry Years 2nd Year	2019	18,173	102%
Consecutive Dry Years 3rd Year	2020	18,603	104%
Consecutive Dry Years 4th Year	2021	20,409	114%
Consecutive Dry Years 5th Year	2022	19,292	108%

5.3. Water Service Reliability

The results of the reliability assessment are summarized below.

As established in **Section 4.8** and **Part 1, Section 5.1.2**, the District utilized the "Real Water" (Utilization-Based) methodology to project its future supplies. Under this operational approach, the District projects its local groundwater and recycled water supplies based on historical averages adjusted for climate change, alongside the integration of new planned local projects. Any remaining unmet demand is fulfilled by purchasing imported water from TVMWD.

The District's projected "Normal Year" water demands over the next 25 years were developed using a demand-per-connection approach as discussed in **Section 4.8** and **Section 5.2**. This approach utilizes a baseline period of 2025 to approximate normal demand patterns; projects future connections based on SCAG growth rates and incorporates anticipated reductions due to passive conservation and compliance with the new "Making Conservation a California Way of Life" (CWOL) regulatory framework.

To estimate projected demands during drought conditions, the District utilized a historical ratio methodology. Because water demand in Southern California typically increases during hot, dry periods due to elevated outdoor irrigation needs, the District analyzed the ratio of total water utilized during historical dry periods compared to a historical average year.

Based on the District's operational data, the historical average year baseline was established using the five-year period of FY 2021–2025 (averaging 17,843 AF).

- **Single Dry Year Scaling:** The ratio of water utilized during the historical single dry year of FY 2021 (20,409 AF) to the historical average (17,843 AF) yielded a scaling factor of 114%. This **114%** factor was applied to the projected normal year demands to estimate the District's projected water demands during future single dry years.
- **Five-Year Drought Scaling:** To estimate demands during a five-consecutive-year drought, the District utilized the historical drought sequence from FY 2018 through FY 2022. The ratio of water utilized in each of these years (21,043 AF, 18,173 AF, 18,603 AF, 20,409 AF, and 19,292 AF, respectively) compared to the historical average yielded scaling factors of **118%, 102%, 104%, 114%, and 108%** for years one through five of the drought sequence, respectively. These factors were applied to the projected normal year demands to forecast future multi-year drought demands.

Because TVMWD and MWD have demonstrated 100% supply reliability to meet wholesale demands through 2050 (supported by MWD's 2025 UWMP supply and reliability analysis (MWD, 2026)), the District's total supply is projected to perfectly meet its total projected demand across all hydrologic scenarios. Consequently, the difference between supply and demand in the tables below is zero, reflecting a fully reliable water portfolio through the 2050 planning horizon.

Table 5-2, *** Note**: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6.** The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-4.**

Table 5-3, and ***Note:** The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6.** The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-4.**

Table 5-4 summarize the District's projected water supplies and demands over the next 25 years in five-year increments. These tables demonstrate the District can reliably meet elevated water demands during normal years, single dry years, and five-consecutive-year drought periods over the next 25 years.

Table 5-2. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

Total	2030	2035	2040	2045	2050
Supply totals	16,369	15,246	14,559	14,580	14,589
Demand totals	16,369	15,246	14,559	14,580	14,589
Difference	**0**	**0**	**0**	**0**	**0**

* Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6**. The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-4**.

Table 5-3. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

Total	2030	2035	2040	2045	2050
Supply totals	18,723	17,438	16,652	16,676	16,686
Demand totals	18,723	17,438	16,652	16,676	16,686
Difference	**0**	**0**	**0**	**0**	**0**

*Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6**. The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-4**.

Table 5-4. DWR 7-4R Multiple Dry Years Supply and Demand Comparison

Year	Total	2030	2035	2040	2045	2050
First Year	Supply Totals	19,305	17,980	17,169	17,195	17,205
	Demand Totals	19,305	17,980	17,169	17,195	17,205
	Difference	0	0	0	0	0
Second Year	Supply Totals	16,672	15,528	14,828	14,849	14,858
	Demand Totals	16,672	15,528	14,828	14,849	14,858
	Difference	0	0	0	0	0
Third Year	Supply Totals	17,066	15,896	15,178	15,201	15,210
	Demand Totals	17,066	15,896	15,178	15,201	15,210
	Difference	0	0	0	0	0
Fourth Year	Supply Totals	18,723	17,438	16,652	16,676	16,686
	Demand Totals	18,723	17,438	16,652	16,676	16,686
	Difference	0	0	0	0	0
Fifth Year	Supply Totals	17,698	16,484	15,741	15,764	15,773
	Demand Totals	17,698	16,484	15,741	15,764	15,773
	Difference	0	0	0	0	0

*Note: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in **Table 2-6**. The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in **Table 4-4**.

6. Drought Risk Assessment

The Drought Risk Assessment (DRA) is an analysis required for the 2025 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2026. While Section 5 evaluated long-term reliability through 2050, the DRA serves as an immediate stress test, focusing specifically on the five-year period from 2026 through 2030. The purpose of this assessment is to determine if the District anticipates any supply shortages in the immediate future that would necessitate triggering mandatory demand reduction measures outlined in the Water Shortage Contingency Plan.

6.1. Data, Methods, and Basis for Water Shortage Conditions

To conduct the DRA, the District utilized the same "Real Water" supply methodology and historical drought scaling factors detailed in **Section 4.8** and **Section 5**. The assessment simulates a severe, five-consecutive-year drought mirroring the hydrology of Fiscal Years 2018 through 2022.

Because hot, dry weather drives increases in outdoor irrigation, the District's unconstrained demands are projected to scale up significantly during this period (up to **118%** of average baseline demand, as established in **Section 5.3**). The DRA tests whether the District's local groundwater, recycled water, and imported water portfolios can sustain these elevated demands over the next five years without natural replenishment.

6.2. DRA Water Source Reliability

The District's near-term reliability is highly secure due to the active management of its regional groundwater basins (including the Puente, Spadra, Main, and Six Basins), the consistent utilization of its recycled water system, and the unprecedented storage reserves held by its wholesale providers.

Entering the 2026–2030 DRA period, MWD holds nearly 4 million acre-feet (MAF) of water in regional storage, which is a near-record high. MWD's 2025 UWMP DRA modeling confirms that even if the SWP and CRA experience five consecutive years of severe constraint, MWD has sufficient stored reserves to meet all wholesale member agency demands without shortage allocations through 2030. Consequently, TVMWD can reliably supply the District with imported water to cover any deficits caused by constrained local groundwater production.

6.3. Total Water Supply and Use Comparison

Table 6-1 details the DRA for the 2026–2030 period. As demonstrated in the table, the District's projected supplies are sufficient to fully and consistently meet the elevated, unconstrained demands for every year of the five-year drought sequence.

Because the District anticipates a supply surplus (a difference of zero) across all five years of the near-term drought scenario, the District does not currently project a need to implement mandatory, extraordinary conservation measures or trigger advanced stages of its WSCP due to supply shortages.

However, the District remains committed to ongoing water conservation and will continue to enforce standard water waste prohibitions to preserve regional storage.

Table 6-1. DWR 7-5 Five-Year Drought Risk Assessment (AF)

Category	2026	2027	2028	2029	2030
Total Water Use (Demand)	19,305	16,672	17,066	18,723	17,698
Total Supplies	19,305	16,672	17,066	18,723	17,698
Surplus/Shortfall without WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP – Supply Augmentation Benefit	0	0	0	0	0
WSCP – Use Reduction Savings Benefit	0	0	0	0	0
Revised Surplus/(Shortfall)	0	0	0	0	0
Resulting % Use Reduction from WSCP Action	**0%**	**0%**	**0%**	**0%**	**0%**

7. Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) is a strategic plan developed by the District to proactively manage and respond to both anticipated and unforeseen water shortages. A water shortage is defined as a condition in which available water supplies are inadequate to meet expected customer demand at a specific point in time. Such shortages may result from various factors, including but not limited to, water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demand.

The District's WSCP is a detailed approach which presents how the District intends to act, or respond, in the case of an actual water shortage. It outlines a process for conducting annual water supply and demand assessments and establishes clearly defined stages and response measures to respond to actual conditions. This level of preparedness enhances transparency, ensures accountability, and supports the District's ability to maintain reliable water service during periods of supply disruption.

The WSCP was prepared in conjunction with the 2025 RUWMP and is presented as a standalone document that may be updated as necessary. No substantive changes have been incorporated into the 2025 WSCP compared to the 2020 version. Minor editorial updates were made for clarity and consistency; however, the content, procedures, and response actions remain relatively unchanged. The District has implemented and remains in a Stage 2 Water Shortage.

The District's WSCP is included in **Part 4, Appendix H-7**.

8. Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the DMMs that the District has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. The District met the 2020 Water Use Target through the implementation of these DMMs. The District expects to continue to implement current conservation programs to encourage conservation and achieve its water use targets.

8.1. Existing Demand Management Measures

8.1.1. Water Waste Prevention Ordinances

Waste is defined as any excessive, unnecessary or unwarranted use of water, including but not limited to any use which causes unnecessary runoff beyond the boundaries of any property as served by its meter and any failure to repair as soon as reasonably possible any leak or rupture in any water pipes, faucets, valves, plumbing fixtures or other water service appliances. The District applies its "Rules and Regulations Governing Water Consumers" (Rules and Regulations), updated in September 2025, throughout its service area. The document is available at this link.

Regulations concerning water waste are established in Section 4.05.02.03 of the Rules and Regulations. Under this section, the District has the authority to disconnect a service if practices that are deemed wasteful are not mitigated within five days after notice to the consumer. In addition, Section 4.07.01 of the Rules and Regulations establishes the following permanent prohibitions in place for combating wasteful practices:

- Limit on Watering Duration
- No Excessive Water Flow or Runoff
- No Washing Down Hard or Paved Surfaces
- Obligation to Fix Leaks, Breaks, or Malfunctions
- Limits on Washing Vehicles
- Recirculating Water Required for Water Fountains and Decorative Water Features
- No Installation of Single Pass Cooling Water Systems
- No Installation of Non-recirculating Water Systems in Commercial Car Wash and Laundry Systems

These water use efficiency requirements are also identified in the District's Ordinance No. 01-18-22 (See **Part 4, Appendix H-4**). The District has continuously implemented its Water Waste Prevention Ordinance over the last five years.

8.1.2. Metering

The District meters all customer connections, including separate metering for single-family residential, multi-family residential, commercial, industrial, and institutional/governmental facilities. Furthermore, if there is new development within the District, each facility is individually metered. Service charges for the District are based on the customers' connection size. Further information regarding the District's water rate structure and conservation pricing is provided in **Section 8.1.3**

The District has continuously metered all connections over the last five years.

8.1.3. Conservation Pricing

The District's current water rates structure is tiered to promote water conservation by customers. The water rates have been developed to fund the cost of water and are related to the overall cost of water service. Single family residential customers are billed on an inclining block rate structure, with a fixed service charge based on meter size to encourage water conservation and discourage waste. The rate structure includes three tiers and differs based on pressure zones within the District. In addition, Ordinance No. 01-18-22 (discussed in **Section 8.1.1**), provides the District with additional water conservation measures to be implemented during a declared Water Supply Shortage, including measures to penalize customers for negligent waste of water.

The District has continuously implemented conservation pricing for customer billing in accordance with its current rate schedule over the last five years.

8.1.4. Public Education and Outreach

8.1.4.1. Public Education

The District maintains a diverse portfolio of public education and communications programs for its customers to learn about and participate in a water-efficient lifestyle. Education and outreach efforts are supported by constant and responsive communication through various mediums that include the District's website, Facebook, Twitter, Instagram, and other social media platforms. TVMWD distributes monthly billing inserts and e-newsletters that serve as a visual guide to inform customers about their water use and ways to conserve, as well as opportunities for them to connect with the District representatives and programs.

The District also places ads in community newspapers and regional newspapers, posts banners, signs, and messages on local marquees to promote water conservation. The District also participates in and sponsors numerous community events. Public education and outreach messages are translated into other languages to ensure all community members within its service area are reached.

Over the last five years, the District has continuously implemented public education and outreach activities.

8.1.4.2. Community Events

The District regularly hosts various events that invite community members to visit its headquarters and learn about where their water comes from, ways to conserve and save on their monthly water bill, interact with the District personnel from every department, participate in live demonstrations of the District equipment, and more.

8.1.4.3. Video Outreach and Virtual Tours

The District has also launched an extensive video campaign in which monthly videos are developed to give customers an inside look at everything related to water, how the District operates, and water savings opportunities. Virtual tours are a component of the video campaign to further extend efforts to bring water education directly to where the customer is located and feels most comfortable.

8.1.4.4. Student Education

The District hosts multiple water education programs for students in the local elementary, middle, and high schools in its service area. The District is committed to providing students and educators with resources for hands-on learning experiences. This includes in-person presentations, supplemental educational materials, virtual presentations, tours, and more.

8.1.4.5. Poster Art Contest

The "Water is Life" poster art contest is available to students in grades 3 through 12 attending schools within the District's service area. The annual poster art contest provides students with the opportunity to learn the importance of using water efficiently while demonstrating their artistic abilities. From 2020 to 2025, over 3,500 students participated in this water education program. Educators and teachers, who have students that participate in the contest, receive water education support from the District through sponsored school supplies, field trips, and more.

8.1.4.6. High School Broadcast Media and Digital Art Contest

The District's high school broadcast media and digital art contest launched in 2019 and encourages students attending schools and living within its service area to develop a water education media campaign based on a specific theme. The theme for the contest is announced in January of each year. In 2025 the theme was *"Being Water Wise Is…"*. Students can learn about water efficiency and efforts to advocate for conservation through various mediums. Since its inception, over 200 students have participated in this water education program.

8.1.4.7. High School Internship Program

The District conducts a high school student internship program in which 15 high school students who attend a school or live within the service area have an opportunity to learn about the water industry and gain hands-on experience. The internship program serves as a career pathway for students within the local community and a catalyst to develop the next generation of water professionals. Since its inception in 1997, more than 200 students have participated in the water education program, including several

who currently hold positions at the District. The internship program was paused from 2021 through 2023 but was reinstated in 2024 with 11 students and continued in 2025 with an additional 11 students.

8.1.4.8. Other Student Education Programs

The District also contracts with the Discovery Science Center to perform live theatre programs to teach students within its service area about water conservation. A 30-minute water education classroom presentation is also available for grades K through 4. Presentations utilize visuals, class discussion, and audience participation to teach students about topics that include water distribution and treatment, the water cycle, and conservation techniques. In addition, each student receives a Water Awareness Bag that includes activity booklets, conservation coloring books, conservation toys and stickers at no cost.

8.1.5. Programs to Assess and Manage Distribution System Real Losses

The District's system is comprised mainly of single and multi-family dwellings. The District has water conservation literature that alerts customers to be on the lookout for leaks and to correct them promptly. The District is available to assist customers in answering questions regarding leaks or higher than expected water usage.

As a part of normal operation and maintenance of the water system, the District's staff does preventive maintenance. This includes regular checks on valves and meters, and pipeline maintenance. If leaks are encountered or suspected during routine inspection of the system, further evaluation is conducted. If leaks are found, they are repaired. The District also uses a leak protection model developed by Fracta. The model enables the District's field crews to focus on the most vulnerable areas shown in the model's map based on a "likelihood of failure" percentage.

The District monitors the water system for loss by comparing water production to water sales. The District will continue to monitor the water system for water loss. If a trend indicates that further analyses are required, the District will provide the necessary funds to institute another leak detection program.

Over the last five years, the District has continuously implemented the activities described here each year. The District will continue these programs to assess and manage distribution system real losses.

8.1.6. Water Conservation Program Coordination and Staffing Support

Various District staff are involved in the water conservation program. These include operations personnel who constantly monitor for water waste, and customer service staff who respond to conservation questions. In addition, the finance department reviews bills for high water usage to identify any potential leaks. The District staff also provide support for water conservation activities focusing on the public outreach programs discussed previously in **Section 8.1.4.** The District plans to continue to provide water conservation program coordination and staffing support.

8.1.7. Other Demand Management Measures

8.1.7.1. Water Use Efficiency and Conservation Programs

The District provides its customers with tools and resources to help them lead a water-efficient lifestyle. Integrating the principles of water conservation and direct savings on their monthly water bill, customers learn not only how to use less water, but waste less. Conservation messaging, program information, and events are available on the District's website, Facebook, Twitter, and Instagram as well as its monthly bill inserts, snipes, and e-newsletter.

The District conducts multiple conservation programs that are available at no cost to customers within its service area. These programs include the District specific classes, workshops, webinars, distributions, and giveaways as well as rebates and retrofits through the District's wholesaler(s) TVMWD and MWD. Conservation goodie bags are provided to customers who participate in the District's varied conservation programs and include items such as water-efficient showerheads, hose nozzles, rain buckets, and moisture meters.

Since the adoption of the Water Use Efficiency Plan (WUE Plan) in 2020, the District has continued to explore new and innovative ways to support our customers' water use efficiency efforts. These initiatives have been designed to provide valuable resources, reduce water consumption, and promote sustainable practices throughout our community. Examples of these efforts include:

- Installation of Hydrant Guard devices.
- Launch of new customer portal.
- Leak repair programs for residential customers.
- Irrigation retrofit assistance.
- Residential pool cover rebate.
- Commercial urinal rebate.
- Metropolitan Water District device rebates and programs.
- How-to guides and webinars for water-saving tips.
- School programs and other educational resources.

Highlighting a few of these efforts:

Hydrant Guard: Enhancing Public Safety, Infrastructure Resilience, and Emergency Preparedness

The installation of Hydrant Guards is a crucial initiative aimed at conserving water and improving public safety. These devices are designed to automatically restrict water flow when a fire hydrant is sheared from its connection, significantly reducing water loss and associated hazards.

The District's analysis shows that each sheared fire hydrant results in an estimated water loss of 0.313 acre-feet (AF), approximately 102,000 gallons. This amount equates to the daily water usage of about 340 average U.S. households, assuming each household uses 300 gallons per day.

By equipping targeted hydrants with Hydrant Guards, incidents of excessive water loss can be substantially reduced. The District estimate at least 10 sheared fire hydrant events annually where Hydrant Guards would be in service, preventing the loss of approximately 3.13 AF of water per year. Over a 20-year period, this would amount to a reduction of about 63 AF of wasted water.

The cost savings from reduced water loss are substantial. In 2026 alone, the District would save approximately $5,700.47 due to decreased water waste. These savings increases annually, reaching an estimated $10,959.16 by 2045, accounting for inflation and rising water costs. Over the projected period, the installation of Hydrant Guards could result in cumulative savings of over $150,000 for the community.

Customer Portal: Empowering Customers for Water Efficiency



The District's new Customer Portal is a powerful tool designed to enhance customer engagement and promote water efficiency. Through this platform, customers receive real-time leak alerts, conservation messaging, turn-off notifications, and more. These proactive communications empower customers to make informed decisions about their water usage, helping them detect and address issues early, reduce waste, and manage their bills more effectively.

By providing easy access to critical water use data, the Customer Portal fosters greater awareness and accountability. This initiative reflects the District's ongoing commitment to supporting customers in their water conservation efforts and ensuring a more sustainable water future for our community.

Leak Repair Program



The District recognizes that even small leaks can lead to significant water waste and higher utility bills for customers. The District offers a leak repair assistance program designed to help residential customers quickly and efficiently address water leaks on their property, to reduce unnecessary water loss.

Through this program, the District proactively identifies customers experiencing continuous water flow above a certain threshold and refers them to a trusted contractor for a professional leak assessment. Once the assessment is complete, the contractor performs necessary repairs to stop the leak, ensuring water is used efficiently. Depending on the specific issue, repairs may include fixing or replacing leaking sprinkler heads, irrigation lines, or broken pipes. In some cases, the contractor may install a pressure-reducing valve or replace a faulty house valve to prevent future leaks and improve water pressure management.

By launching this program, the District is not only helping customers save water but also reducing their monthly water bills and promoting sustainable water use in the community. The District is committed to making the process as easy and effective as possible for our customers.

These programs have been continuously in effect for the last five years.

8.1.7.2. Landscape and Garden Design Workshops

The District offers customers within its service area regular landscape classes with topics focused on “California Friendly & Native Plant Landscaping” and “Turf Removal & Garden Transformation”. These events are held in-person and online offering customers continued flexibility. Participation in this conservation program includes a conservation goodie bag, landscape design worksheets, and manuals to provide continued support.

8.1.7.3. Fix-A-Leak Week

The District participates in U.S. Environmental Protection Agency’s (USEPA) annual Fix-A-Leak Week. This WaterSense Program serves to educate customers about water savings in and around their homes. The

District offers a Leak Detection Class and distributes leak detection kits throughout the entire week for customers who complete a short survey.

8.1.7.4. Turf Removal Program

Turf grass is a common and expensive landscape covering which often consumes a large percentage of a property's water use and requires regular maintenance. The District offers turf removal workshops in-person and online and assists customers in applying for and submitting turf replacement rebate requests.

8.1.7.5. Premium High-Efficiency Toilet (PHET) Replacement Program

In partnership with the SoCal WaterSmart program and MWD, the District conducted a PHET replacement program from 2015 through 2019. More than 1,000 high-efficiency toilets were provided to customers within the District's service area. While the program was discontinued in 2020, customers remain eligible for rebates for qualifying toilets and rain barrels.

8.1.7.6. Rain Barrel Distribution and Rebates

The District offers rebates to customers that collect and re-use rainwater for their homes. From 2015 through 2018 the District hosted a rain barrel distribution, providing more than 2,000 rain barrels to customers within its service area. The District has not offered a rain barrel distribution program since 2018.

8.1.7.7. High-Efficiency Device Rebates

The District promotes rebates for high-efficiency devices for both residential and commercial customers within its service area. Applicable devices include water-efficient clothes washers, PHET, sprinkler nozzles, rain barrels, weather-based irrigation controllers (WBIC), moisture sensors, plumbing fixtures, landscaping equipment, food equipment, and more. Detailed information for each device, qualifying products, and access to the application portal is available on the District's website.

Over the last five years, the District has provided rebates for this program.

9. Adoption, Submittal, and Implementation

This section describes the District's process for adopting, submitting, and implementing the 2025 RUWMP and WSCP.

9.1. Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2025 UWMPs are part of the 2025 RUWMP to all cities and counties and other stakeholders within the region that2025 RUWMP is being prepared. This notice was sent at least 60 days prior to the District's public hearing. The recipients are identified in **Part 1 Chapter 1** of the 2025 RUWMP and include all cities and counties within the District's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

The District provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4, Appendix H-2**.

9.2. Public Hearing and Adoption

The District held a public hearing on **May 18, 2026** to hear public comments and consider adopting this 2025 RUWMP and the District's WSCP. As part of the public hearing, the District provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2025 RUWMP took place before the adoption of the Plan, which allowed the District the opportunity to modify the 2025 RUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

The District's adoption resolution for the 2025 RUWMP and the District's WSCP is included in **Part 4, Appendix H-3.**

9.3. Plan Submittal

The District will submit the 2025 RUWMP and the District's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2025 RUWMP submittal to DWR will be done electronically through DWR's "Water Use Efficiency (WUE) Data Portal" website. The complete set of DWR Submittal Tables for the District is included in **Part 4, Appendix H-5**.

9.4. Public Availability

Within 30 days of submitting its Plan to DWR, the District will make the 2025 RUWMP and the District's WSCP available for public review. Copies will be accessible during normal business hours at its main office location and posted on the District's website for public viewing.

9.5. Amending an Adopted UWMP or WSCP

If the adopted 2025 RUWMP or the District's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

10. References

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THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 3: Regional Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 3: Regional Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

A: DWR Regional UWMP Checklist

Requirement Summary	2025 Regional UWMP Location	Compliance Status
Coordination with local agencies and shared supplies	Part 1 Chapter 1 Section 3	Met
Public participation prior to adoption	Part 1 Chapter 1 Section 1.3.2 Part 3 Appendix B-C	Met
Public hearing and adoption	Part 1 Chapter 1 Section 1.4	Met
Submittal to DWR and State Library	Part 3 Appendix G	Met
Describe service area and regional setting	Part 1 Chapter 1 Section 1	Met
Climate description	Part 1 Chapter 2 Section 1 Part 3 Appendix I	Met
Demographics & population projections	Part 1 Chapter 2 Sections 3	Met
Land use	Part 1 Chapter 2 Section 4	Met
Identify and quantify existing and planned water supplies	Part 1 Chapters 3 and 5	Met
Normal, single-dry, and five-year drought supply	Part 1 Chapter 5	Met
Management of multiple sources	Part 1 Chapter 3	Met
Planned water supply projects	Part 1 Chapter 3 Section 9	Met
Transfers/exchanges	Part 1 Chapter 3 Section 6	Met
Desalination opportunities	Part 1 Chapter 3 Section 8	
Basin descriptions	Part 1 Chapter 3 Section 2	Met
Adjudication / SGMA status	Part 1 Chapter 3 Part 3 Appendix K-P	Met
Historic and projected pumping	Part 1 Chapter 3	Met
Wastewater treatment and recycled water use	Part 1 Chapter 3 Section 5	Met
Planned reuse and feasibility	Part 1 Chapter 3 Section 5.3	Met
Historic and projected water use	Part 1 Chapter 4	Met
SBX7-7 compliance	Part 1 Chapter 4 Section 2.1	Met
UWUO & CWOL framework	Part 1 Chapter 4 Section 2.2	Met

Requirement Summary	2025 Regional UWMP Location	Compliance Status
Demand Management Measures (DMMs)	Part 1 Chapter 4 Section 2.3	Met
20-year WSRA	Part 1 Chapter 5	Met
Lay description of WSRA	Part 1 Chapter 1 Executive Summary	Met
Five-year drought risk analysis	Part 1 Chapter 5 Section 2.3	Met
Lay description of DRA	Part 1 Chapter 1 Executive Summary Part 1 Chapter 5	Met
WSCP summary and consistency	Part 1 Chapter 1	Met

B: 60-Day Notice of Preparation Letters

Agency	60-Day Notice of Preparation Reference
Three Valleys Municipal Water District	Part 4 Appendix A-2 – Attachment 1
City of Glendora	Part 4 Appendix B-2 – Attachment 1
City of La Verne	Part 4 Appendix C-2 – Attachment 1
City of Pomona	Part 4 Appendix D-2 – Attachment 1
Golden State Water Company - Claremont	Part 4 Appendix E-2 – Attachment 1
Golden State Water Company - San Dimas	Part 4 Appendix F-2 – Attachment 1
Rowland Water District	Part 4 Appendix G-2 – Attachment 1
Walnut Valley Water District	Part 4 Appendix H-2 – Attachment 1

C: Notice Distribution Lists

Agency/City/County	Three Valleys Municipal Water District	City of Glendora	City of La Verne	City of Pomona	GSWC - Claremont	GSWC - San Dimas	Rowland Water District	Walnut Valley Water District
Building Industry Association	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Cal Poly Pomona	✓	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chino Basin Watermaster	✓	n/a	n/a	✓	n/a	n/a	n/a	n/a
City of Azusa	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
City of Claremont	✓	n/a	✓	✓	✓	n/a	n/a	n/a
City of Covina	✓	✓	n/a	n/a	n/a	✓	n/a	n/a
City of Diamond Bar	✓	n/a	n/a	n/a	n/a	n/a	✓	✓
City of Glendora	✓	✓	n/a	n/a	n/a	✓	n/a	n/a
City of Industry	✓	n/a	n/a	n/a	n/a	n/a	✓	✓
City of La Habra	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
City of La Puente	✓	n/a	n/a	n/a	n/a	n/a	✓	n/a
City of La Verne	✓	n/a	n/a	n/a	n/a	✓	n/a	n/a
City of Montclair	n/a	n/a	n/a	n/a	✓	n/a	n/a	n/a
City of Pomona	✓	n/a	✓	✓	✓	n/a	✓	n/a
City of San Dimas	n/a	n/a	✓	n/a	n/a	✓	n/a	n/a
City of Upland	n/a	n/a	n/a	✓	✓	n/a	n/a	n/a
City of Walnut	✓	n/a	n/a	n/a	n/a	✓	✓	✓
City of West Covina	n/a	n/a	n/a	n/a	n/a	n/a	✓	✓
City of Whittier	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Covina Valley Water Company	✓	✓	n/a	n/a	n/a	n/a	✓	n/a
Golden State Water Co.	✓	✓	✓	✓	n/a	n/a	n/a	n/a
Hacienda La Puente Unified School District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Inland Empire Utilities Agency	✓	n/a	n/a	n/a	n/a	n/a	n/a	n/a
La Habra Heights County Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a

Agency/City/County	Three Valleys Municipal Water District	City of Glendora	City of La Verne	City of Pomona	GSWC - Claremont	GSWC - San Dimas	Rowland Water District	Walnut Valley Water District
La Puente Valley County Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Los Angeles County	✓	✓	✓	✓	✓	✓	✓	✓
Main San Gabriel Basin Watermaster	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
Metropolitan Water District	✓	n/a	n/a	✓	n/a	n/a	n/a	n/a
Mt. San Antonio College	✓	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pico Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Rowland Unified School District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Rowland Water District	✓	n/a	n/a	✓	n/a	n/a	n/a	✓
Six Basins Watermaster	✓	n/a	n/a	✓	n/a	n/a	n/a	n/a
Suburban Water Systems	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
Sycamore Development Partners	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Three Valleys Municipal Water District	n/a	✓	✓	✓	n/a	n/a	✓	✓
Upper San Gabriel Valley Municipal Water District	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
Valley County Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a
Walnut Valley Water District	✓	n/a	n/a	✓	n/a	n/a	✓	n/a
Yorba Linda Water District	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a

Note: n/a = not applicable.

D: Proofs of Publication

This document will be provided upon request through our contact us page.

E: Regional Workshops Materials

E – Attachment 1: Regional Workshop #1 Materials

This document will be provided upon request through our contact us page.

E – Attachment 2: Regional Workshop #2 Materials

This document will be provided upon request through our contact us page.

F: Three Valleys Regional Urban Water Management Plan Adoption Resolution

RESOLUTION NO. 26-06-1026

A RESOLUTION OF THE BOARD OF DIRECTORS OF THREE VALLEYS MUNICIPAL WATER DISTRICT TO ADOPT THE 2025 REGIONAL URBAN WATER MANAGEMENT PLAN

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, an urban water management plan every five years; and

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such urban water management plans; and

WHEREAS, the Board of Directors of Three Valleys Municipal Water District has duly reviewed, discussed, and considered the 2025 Regional Urban Water Management Plan and has determined the 2025 Regional Urban Water Management Plan to be consistent with the Urban Water Management Planning.

NOW THEREFORE BE IT RESOLVED by the Board of Directors of Three Valleys Municipal Water District that, on June 3, 2026, this District hereby adopts this 2025 Regional Urban Water Management Plan for submittal to the State of California.

ADOPTED and **PASSED** at a meeting of the Three Valleys Municipal Water District's Board of Directors, on this 3rd day of June 2026 by the following vote:

AYES: DE JESUS, GOYTIA, HANLON, KUHN, ROBERTO, TI
NOES:
ABSTAIN:
ABSENT: MARQUEZ

Mike Ti, President

ATTEST:

Jeff Hanlon, Secretary

SEAL:



G: Transmittal Letters to State Library and Cities/Counties

This document will be provided upon request through our contact us page.

H: Three Valleys Municipal Water District 2025 Water Resources Master Plan

This document will be provided upon request through our contact us page.

I: 2024 Climate Change Vulnerability Analysis

This document will be provided upon request through our contact us page.

J: Metropolitan Water District Wholesaler Reliability Data

This document will be provided upon request through our contact us page.

K: Main Basin Materials

K – Attachment 1: Main San Gabriel Basin Judgment

This document will be provided upon request through our contact us page.

K – Attachment 2: Main San Gabriel Basin Five-Year Water Quality and Supply Plan (2023-2028)

This document will be provided upon request through our contact us page.

K – Attachment 3: Three Valleys Municipal Water District/Metropolitan Water District Main San Gabriel Basin Cyclic Storage Agreement

This document will be provided upon request through our contact us page.

K – Attachment 4: Puente Basin Water Agency Storage and Export Agreement

This document will be provided upon request through our contact us page.

L: Chino Basin Materials

L – Attachment 1: Chino Basin Judgment (1978)

This document will be provided upon request through our contact us page.

L – Attachment 2: Chino Basin Peace Agreement (2000)

This document will be provided upon request through our contact us page.

L – Attachment 3: Three Valleys Municipal Water District One-Time Storage Agreement (Chino Basin)

This document will be provided upon request through our contact us page.

L – Attachment 4: Chino Basin Optimum Basin Management Program

This document will be provided upon request through our contact us page.

M: Six Basins Materials

M – Attachment 1: Six Basins Judgment (1998)

This document will be provided upon request through our contact us page.

M – Attachment 2: Three Valleys Municipal Water District Operational Storage Account Agreement (Six Basins)

This document will be provided upon request through our contact us page.

M – Attachment 3: Six Basins Strategic Plan

This document will be provided upon request through our contact us page.

N: Spadra Basin Materials

N – Attachment 1: Spadra Basin Groundwater Sustainability Agency Memorandum of Agreement

This document will be provided upon request through our contact us page.

N – Attachment 1: Spadra Basin Groundwater Sustainability Plan

This document will be provided upon request through our contact us page.

O: Covina Valley Water Company Pre-1914 Appropriative Water Rights Documentation

This document will be provided upon request through our contact us page.

P: City of Pomona Pre-1914 Appropriative Water Rights Documentation

This document will be provided upon request through our contact us page.

Q: SWRCB Wastewater Change Petition Order WW0104

This document will be provided upon request through our contact us page.

R: SWRCB Wastewater Change Petition Order WW0107

This document will be provided upon request through our contact us page.

S: Metropolitan Water District Chino Basin Dry-Year Yield Program Agreement

This document will be provided upon request through our contact us page.

T: Central Basin Adjudication

This document will be provided upon request through our contact us page.

U: Puente Basin Materials

U – Attachment 1: Puente Basin Judgment (1985)

This document will be provided upon request through our contact us page.

U – Attachment 2: Puente Narrows Agreement

This document will be provided upon request through our contact us page.

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

A

2025 RUWMP Part 4
Three Valleys Municipal Water District
Appendix A

A1: UWMP Compliance Checklist

Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Part 2 Chapter 1 Part 1 Chapter 3
x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Part 1 Chapter 1 Executive Summary
x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Part 2 Chapter 1
n/a	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	n/a
x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Part 2 Chapter 1
x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Part 2 Chapter 1
x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Part 4 appendix A
x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Part 4 Appendix A-2
n/a	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	n/a
x	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	Part 2 Chapter 1 Section 4
x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Part 2 Chapter 1 Section 1.1
x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Part 2 Chapter 1 Section 1.1
x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Part 2 Chapter 1 Section 1.1
x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Part 2 Chapter 1 Section 1.1
x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Part 2 Chapter 1 Section 1.1
Optional	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Part 2 Chapter 1 Section 2
Optional	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Part 2 Chapter 1 Section 2.1.3
n/a	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	n/a
n/a	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	n/a
n/a	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	n/a
n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	n/a

Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
n/a	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	n/a
x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Part 2 Chapter 1 Section 2.4 Part 1 Chapter 5
x	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	Part 2 Chapter 1 Section 3
n/a	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	n/a
x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Part 2 Chapter 1 Section 4 Part 1 Chapter 3
x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Part 2 Chapter 1 Section 4 Part 2 Chapter 1 Section 5.3 Part 1 Chapter 5 Section 2
x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Part 2 Chapter 1 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Part 2 Chapter 1 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Part 2 Chapter 1 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Part 2 Chapter 1 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Part 2 Chapter 1 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Part 2 Chapter 1 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Part 2 Chapter 1 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Part 2 Chapter 1 Section 4.8

Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Part 2 Chapter 1 Section 4.8 Part 1 Chapter 3 Part 1 Chapter 5
x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Part 2 Chapter 1 Section 4.6
n/a	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	n/a
x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Part 2 Chapter 1 Section 4.5
x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Part 2 Chapter 1 Section 4.5.1
x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Part 2 Chapter 1 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Part 2 Chapter 1 Section 4.5 Part 1 Chapter 3 Section 5 Part 4 appendix A
x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Part 1 Chapter Section 5
x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Part 1 Chapter 3 Section 8
x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Part 2 Chapter 1 Section 4.7 Part 1 Chapter 3 Section 9
x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Part 2 Chapter 1 Section 4.9 Part 4 appendix A
x	7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Part 2 Chapter 1 Section 5 Part 1 Chapter 3
x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Part 2 Chapter 1 Section 5.3 Part 1 Chapter 5 Section 2
x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Part 1 Chapter 3
x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Part 2 Chapter 1 Section 2.4 Part 1 Chapter 5

Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Part 2 Chapter 1 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Part 2 Chapter 1 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Part 2 Chapter 1 Section 5.1 Part 1 Chapter 5
x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Part 4 appendix A-5
x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Part 4 appendix A-5
x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Part 4 appendix A-5
x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Part 4 appendix A-5
x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Part 4 appendix A-5
x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Part 4 appendix A-5
x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Part 4 appendix A-5
x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Part 4 appendix A-5
n/a	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	n/a
x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies*.	Water shortage contingency planning	n/a	Part 4 appendix A-5

Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 appendix A-5
x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 appendix A-5
n/a	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought*.	Water shortage contingency planning	n/a	n/a
n/a	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	n/a
x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Part 4 appendix A-5
n/a	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	n/a
x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Part 4 appendix A-5
n/a	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	n/a
x	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	Part 2 Chapter 1 Section 8
n/a	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	n/a
x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Part 2 Chapter 1 Section 9 Part 4 appendix A
x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 1 Section 9
x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Part 4 appendix A-3
x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Part 4 appendix A-3
x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Part 4 appendix A-3
x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 1 Section 9
x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 1 Section 9

Wholesale (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 1 Section 9
x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 1 Section 9
x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 1 Section 9
x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 1 Section 9
x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 1 Section 9

A2: Public Outreach

A2: Attachment 1 – 60 Day Notices

This document will be provided upon request through our contact us page.

A2: Attachment 2 – Regional Workshop #1 Materials

This document will be provided upon request through our contact us page.

A2: Attachment 3 - Regional Workshop #2 Materials

This document will be provided upon request through our contact us page.

A3: Adoption Resolution

RESOLUTION NO. 26-06-1026

A RESOLUTION OF THE BOARD OF DIRECTORS OF THREE VALLEYS MUNICIPAL WATER DISTRICT TO ADOPT THE 2025 REGIONAL URBAN WATER MANAGEMENT PLAN

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, an urban water management plan every five years; and

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such urban water management plans; and

WHEREAS, the Board of Directors of Three Valleys Municipal Water District has duly reviewed, discussed, and considered the 2025 Regional Urban Water Management Plan and has determined the 2025 Regional Urban Water Management Plan to be consistent with the Urban Water Management Planning.

NOW THEREFORE BE IT RESOLVED by the Board of Directors of Three Valleys Municipal Water District that, on June 3, 2026, this District hereby adopts this 2025 Regional Urban Water Management Plan for submittal to the State of California.

ADOPTED and **PASSED** at a meeting of the Three Valleys Municipal Water District's Board of Directors, on this 3rd day of June 2026 by the following vote:

AYES: DE JESUS, GOYTIA, HANLON, KUHN, ROBERTO, TI
NOES:
ABSTAIN:
ABSENT: MARQUEZ

Mike Ti, President

ATTEST:

Jeff Hanlon, Secretary

SEAL:



A4: DWR Tables

Submittal Table 2-2: Plan Identification

Type of Plan	Name of Regional Alliance or RUWMP
Individual UWMP	Three Valleys Regional Urban Water Management Plan

Submittal Table 2-3: Supplier Identification

Type of Supplier	Year Type	Month and date that the year begins (mm/dd)	Units of measure used in UWMP
Supplier is a wholesale supplier	Fiscal Year	07/01	AF

Submittal Table 2-4 Wholesale Retail: Water Supplier Information Exchange

Did the Supplier inform more than 10 other water suppliers of water supplies available.	Provide the location of the list.
Yes	Part 4 Appendix A2

Submittal Table 3-1 Wholesale: Population - Current and Projected

Category	2025	2030	2035	2040	2045	2050*(opt)*
Population Served	523,431	531,175	538,918	541,175	543,431	545,688

Optional Submittal Table 4-1 Wholesale: Total Uses for Potable and Non-Potable Water — Actual

Use Type	Additional Description (as needed)	2025 Actual Water Use Potable or Non-Potable	2025 Actual Water Use Volume (AF)
Sales to other agencies	Miramar Treatment Plant	Non-Potable	21,843
Sales to other agencies	Covina Irrigating Company	Non-Potable	6,648
Sales to other agencies	Direct Deliveries (MWD)	Potable	22,611
Sales to other agencies	Direct Deliveries (Six Basins)	Potable	81
Groundwater recharge	Spreading / Replenishment	Non-Potable	3,583
		Subtotal Potable	22,692
		Subtotal Non-Potable	32,074
		Total	**54,766**

Optional Submittal Table 4-2 Wholesale: Total Uses for Potable and Non-Potable Water — Projected

Use Type	Additional Description	Projected Water Use Potable or Non-Potable (Optional)	Projected Water Use 2030 (AF)	Projected Water Use 2035 (AF)	Projected Water Use 2040 (AF)	Projected Water Use 2045 (AF)	Projected Water Use 2050 opt (AF)
Sales to other agencies			59,930	55,315	54,118	53,897	53,899
Groundwater recharge		Non-Potable	3,000	3,000	3,000	3,000	3,000
		Subtotal Potable	0	0	0	0	0
		Subtotal Non-Potable	3,000	3,000	3,000	3,000	3,000
		Total	**62,930**	**58,315**	**57,118**	**56,897**	**56,899**

Optional Submittal Table 4-5 Wholesale: Water Loss Audit Reporting

Public Water System ID #	Reporting Period	Submitted to DWR Water Loss Audit Program
	2020	
	2021	
	2022	
	2023	
	2024	
	2025	

Notes: As a wholesale supplier, TVMWD is not required by DWR to perform water loss audits and report distribution system water loss; therefore, this table was intentionally left blank.

Submittal Table 6-1 Wholesale: Groundwater Volume Pumped

Groundwater Type	Potable or Non-Potable (OPTIONAL)	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Alluvial Basin		Six Basins	859	1,034	686	2,347	81
		Total	**859**	**1,034**	**686**	**2,347**	**81**

Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (Optional)	2025 Volume of Wastewater Received from UWMP Service Area (AF)	Total 2025 Volume of Water Treated (AF)	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Treatment Level	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Volume (AF)	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Treatment Level	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Treatment Level	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Name of other entity
Total		**0**	**0**		**0**		**0**		**0**		**0**		**0**	

Notes: The Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water; therefore, this table was intentionally left blank.

Submittal Table 6-4 Wholesale: Current and Projected Recycled Water Uses

Use Type	Potable or Non-Potable (after treatment if treated) (Optional)	Additional Information	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use Volume	Potential Recycled Water Use Narrative page number (Optional)
		Subtotal Potable	0	0	0	0	0	0	0	
		Subtotal Non-Potable								
		Total								

Notes: Recycled water is currently not used and not planned for use within the service area of the supplier; therefore, this table was intentionally left blank.

Submittal Table 6-5 Wholesale: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual

Use Type	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Total		

Notes: Recycled water was not used or distributed by the supplier in 2025, nor projected for use or distribution in 2020; therefore, this table was intentionally left blank.

Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other suppliers?	If Yes, Supplier Name	Additional Description	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AF)
Constructing additional groundwater production wells	No		The District's objective is to construct a new well about every two years		Ongoing	All Year Types	5,000

Notes: There are future water supply projects or programs not compatible with this table; therefore, are described in narrative form in Section 4.7 of the UWMP**.**

Submittal Table 6-8 Wholesale: Water Supplies — Actual

Water Supply	Additional Description	2025 Potable or Non-Potable (after treatment if treated) (Optional)	2025 Actual Volume (AF)	2025 Total Entitlement (AF) (Optional)
Purchased or Imported Water	Metropolitan Water District – TVMWD (Direct Deliveries)	Potable	22,611	
Purchased or Imported Water	Metropolitan Water District – TVMWD (Raw Water to Water Treatment Plants, Spreading)	Non-Potable	32,074	
Groundwater (not desalinated)	Six Basins	Potable	81	
		Subtotal Potable	22,692	0
		Subtotal Non-Potable	32,074	0
		Total	**54,766**	**0**

Submittal Table 6-9 Wholesale: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Projected Water Supply 2030 Reasonably Available Volume (AF)	Projected Water Supply 2030 Total Entitlement (AF) (Optional)	Projected Water Supply 2035 Reasonably Available Volume (AF)	Projected Water Supply 2035 Total Entitlement (AF) (Optional)	Projected Water Supply 2040 Reasonably Available Volume (AF)	Projected Water Supply 2040 Total Entitlement (AF) (Optional)	Projected Water Supply 2045 Reasonably Available Volume (AF)	Projected Water Supply 2045 Total Entitlement (AF) (Optional)	Projected Water Supply 2050 Reasonably Available Volume (AF)	Projected Water Supply 2050 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Six Basins		3,000		3,000		3,000		3,000		3,000	
Purchased or Imported Water	Metropolitan Water District - TVMWD (Groundwater Recharge, Spreading)		3,000		3,000		3,000		3,000		3,000	
Purchased or Imported Water	Metropolitan Water District - TVMWD		56,930		52,315		51,118		50,897		50,899	
		Subtotal Potable	0	0	0	0	0	0	0	0	0	0
		Subtotal Non-Potable	0	0	0	0	0	0	0	0	0	0
		Total	**62,930**	**0**	**58,315**	**0**	**57,118**	**0**	**56,897**	**0**	**56,899**	**0**

OPTIONAL Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year	Volume Available (AF)	Percent of Average Supply
Average Year	2021-2025	56,387	100%
Single-Dry Year	2021	70,282	125%
Consecutive Dry Years 1st Year	2018	68,486	121%
Consecutive Dry Years 2nd Year	2019	63,648	113%
Consecutive Dry Years 3rd Year	2020	76,723	136%
Consecutive Dry Years 4th Year	2021	70,282	125%
Consecutive Dry Years 5th Year	2022	65,606	116%

Submittal Table 7-2 Wholesale: Normal Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	62,930	58,315	57,118	56,897	56,899
Use totals	62,930	58,315	57,118	56,897	56,899
Difference	**0**	**0**	**0**	**0**	**0**

Notes:

Submittal Table 7-3 Wholesale: Single Dry Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	78,438	72,686	71,194	70,918	70,921
Use totals	78,438	72,686	71,194	70,918	70,921
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Use Comparison

Year	Total Type / Difference	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	76,433	70,828	69,374	69,106	69,108
	Use totals	76,433	70,828	69,374	69,106	69,108
	Difference	**0**	**0**	**0**	**0**	**0**
Second year	Supply totals	71,034	65,825	64,474	64,224	64,226
	Use totals	71,034	65,825	64,474	64,224	64,226
	Difference	**0**	**0**	**0**	**0**	**0**
Third year	Supply totals	85,626	79,347	77,718	77,417	77,420
	Use totals	85,626	79,347	77,718	77,417	77,420
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth year	Supply totals	78,438	72,686	71,194	70,918	70,921
	Use totals	78,438	72,686	71,194	70,918	70,921
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth year	Supply totals	73,219	67,850	66,457	66,200	66,202
	Use totals	73,219	67,850	66,457	66,200	66,202
	Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-5 Wholesale: Five-Year Drought Risk Assessment

Totals	2026	2027	2028	2029	2030
Total Water Use (AF)	76,433	71,034	85,626	78,438	73,219
Total Supplies (AF)	76,433	71,034	85,626	78,438	73,219
Difference w/o WSCP Action (AF)	**0**	**0**	**0**	**0**	**0**

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		

Notes: The Supplier uses the standard six levels of water shortage; therefore, supplier-specific shortage levels and percentage ranges are not separately identified in this table.

Submittal Table 8-2 Wholesale: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (Percentage)	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)
1	Transfers		Not applicable (see notes)	
2	Transfers		Not applicable (see notes)	
3	Transfers		Not applicable (see notes)	
4	Transfers		Not applicable (see notes)	
5	Transfers		Not applicable (see notes)	
6	Transfers		Not applicable (see notes)	

Notes: The District is a wholesale water supplier that provides treated imported water from the State Water Project through MWD to its sub-agencies. The District does not anticipate augmenting water supplies. However, the District's sub- agencies will consider increased production from the Main Basin, Chino Basin, and/or Six Basins (through potential transfer of water rights) using existing facilities to address increased demands. The District plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

Submittal Table 8-3 Wholesale: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 1 actions is up to 5,240 AF		Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 1 actions is up to 5,240 AF		Yes
2	Other	Volume	Collective reduction from all Shortage Level 2 actions is up to 10,479 AF	All actions under Shortage Level 1	Yes
3	Other	Volume	Collective reduction from all Shortage Level 3 actions is up to 15,719 AF	All actions under Shortage Level 2	Yes
4	Other	Volume	Collective reduction from all Shortage Level 4 actions is up to 20,959 AF	All actions under Shortage Level 3	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
4	Water Features - Restrict water use for decorative water features, such as fountains	Volume	Collective reduction from all Shortage Level 4 actions is up to 20,959 AF	Prohibit filling or refilling ornamental lakes or ponds	Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Volume	Collective reduction from all Shortage Level 4 actions is up to 20,959 AF		Yes
4	Other water feature or swimming pool restriction	Volume	Collective reduction from all Shortage Level 4 actions is up to 20,959 AF	Prohibit initial filling or refilling of more than one foot of residential swimming pools or outdoor spas	Yes
5	Other	Volume	Collective reduction from all Shortage Level 5 actions is up to 26,198 AF	All actions under Shortage Level 4	Yes
6	Other	Volume	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF	All actions under Shortage Level 5	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
6	Landscape - Prohibit all landscape irrigation	Volume	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF		Yes
6	Other	Volume	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF	No new potable water service	Yes
6	Implement or Modify Drought Rate Structure or Surcharge	Volume	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF		Yes
6	Other	Volume	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF	Direct end users that use landscape irrigation systems to irrigate must use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain	Yes
4	Water Features - Restrict water use for decorative water features, such as fountains	Volume	Collective reduction from all Shortage Level 1 actions is up to 5,240 AF		Yes

Submittal Table 10-1 Retail: Notification to Cities and Counties

City or County Name	60 Day Notice	Notice of Public Hearing
Azusa	Yes	Yes
Claremont	Yes	Yes
Covina	Yes	Yes
Diamond Bar	Yes	Yes
Glendora	Yes	Yes
Industry	Yes	Yes
La Puente	Yes	Yes
La Verne	Yes	Yes
Pomona	Yes	Yes
Walnut	Yes	Yes
Los Angeles County	Yes	Yes

A5: Water Shortage Contingency Plan

A5: Attachment 1 – Water Shortage Contingency Plan Adoption Resolution

RESOLUTION NO. 26-06-1027

A RESOLUTION OF THE BOARD OF DIRECTORS OF THREE VALLEYS MUNICIPAL WATER DISTRICT TO ADOPT THE 2025 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, a water shortage contingency plan every five years; and

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such water shortage contingency plans; and

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers to conduct an annual water supply and demand assessment (Annual Assessment) each year and to include in their water shortage contingency plans the procedures they use to conduct the Annual Assessment; and

WHEREAS, the procedures used to conduct an Annual Assessment include, but are not limited to, the written decision-making process that an urban water supplier will use each year to determine its water supply reliability; and

WHEREAS, the Board of Directors of Three Valleys Municipal Water District has duly reviewed, discussed, and considered such Water Shortage Contingency Plan and has determined the 2025 Water Shortage Contingency Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of the planned actions during shortage conditions for Three Valleys Municipal Water District.

NOW THEREFORE BE IT RESOLVED by the Board of Directors of Three Valleys Municipal Water District that, on June 3, 2026, this District hereby adopts this 2025 Water Shortage Contingency Plan for submittal to the State of California.

ADOPTED and **PASSED** at a meeting of the Three Valleys Municipal Water District's Board of Directors, on this 3rd day of June 2026 by the following vote:

AYES: DE JESUS, GOYTIA, HANLON, KUHN, ROBERTO, TI
NOES:
ABSTAIN:
ABSENT: MARQUEZ

Mike Ti, President

ATTEST:

Jeff Hanlon, Secretary

SEAL:



A5: Attachment 2 – Water Shortage Contingency Plan

2025 WATER SHORTAGE CONTINGENCY PLAN

THREE VALLEYS MUNICIPAL WATER DISTRICT

ACRONYMS AND ABBREVIATIONS

Acronym	Description
AF	Acre-Foot
AFY	Acre-Feet per Year
CWC	California Water Code
District	Three Valleys Municipal Water District
DWR	California Department of Water Resources
ERP	Emergency Response Plan
FY	Fiscal Year
GSWC	Golden State Water Company
MWD	Metropolitan Water District of Southern California
RRA	Risk and Resilience Assessment
SWP	State Water Project
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan

WATER SHORTAGE CONTINGENCY PLAN

LAY DESCRIPTION

WATER SHORTAGE CONTINGENCY PLAN

Three Valleys Municipal Water District's (District) 2025 Water Shortage Contingency Plan (WSCP) discusses and provides the following:

- The District's WSCP is a detailed approach which presents how the District intends to act, or respond, in the case of an actual water shortage.
- Preparation of the District's "Annual Water Supply and Demand Assessment" (Annual Assessment) is discussed. Since July 1, 2022, the District has submitted the Annual Assessment each year through 2025. The Annual Assessment includes a review of the District's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent the District's water demands prior to any response actions the District may invoke pursuant to the District's WSCP.
- The District will manage water supplies to minimize the adverse impacts of water shortages. The District's plan for water usage during periods of shortage is designed to incorporate six standard and progressive water shortage levels including up to a 10, 20, 30, 40, and 50 percent shortage, and greater than a 50 percent shortage.
- For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level
- For each declared water supply shortage level, the District has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.

- The operational changes the District will consider in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- The District's Emergency Response Plan (ERP) is summarized. The ERP provides the management, procedures, and designated actions the District and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of the District's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of 's water service area are provided.
- The effectiveness of the shortage response actions for each of the District's standard water shortage levels is presented. The District has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands.
- The communication protocols implemented by the District when it declares any water shortage level are presented.
- The legal authorities associated with District's standard water shortage levels are presented.
- The financial consequences associated with District's standard water shortage levels are presented.
- The District will evaluate the need for revising the WSCP to resolve any water shortage gaps, as necessary. The steps necessary for the District to adopt and amend its WSCP are presented.

The following WSCP includes references to Chapters and Sections from the District's 2025 Urban Water Management Plan (UWMP):

1. WATER SUPPLY RELIABILITY ANALYSIS

CWC 10632.

(a)(1) The analysis of water supply reliability conducted pursuant to Section 10635.

The District's sources of supply were discussed in Chapter 4 of the 2025 UWMP and consist of groundwater from Six Basins and untreated imported water purchased from the Metropolitan Water District of Southern California (MWD). Six Basins is adjudicated and groundwater supplies are managed. The reliability of the various sources of supply are discussed in Chapter 5 of the UWMP. Imported water supplies may be impacted in the event MWD implements its Water Supply Allocation Plan (WSAP) due to a water supply shortage.

2. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

CWC 10632.

(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

CWC 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

Since July 1, 2022, the District has submitted an Annual Assessment in accordance with the California Department of Water Resources' (DWR) guidance and requirements. The Annual Assessment includes a review of the District's unconstrained water demands (i.e. water demands prior to any projected response actions the District may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. The District also includes information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the District's WSCP.

By April of each year the District prepares a preliminary Annual Assessment, which evaluates the adequacy of its water supplies for the current and upcoming years. The preliminary assessment includes a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

2.1 DECISION MAKING PROCESS

The District purchases untreated imported water as its primary source of water supply. Consequently, during the third quarter of each fiscal year (FY) the District reviews its water demands from the initial six months along with the current groundwater basin conditions, local hydrology and imported water supply outlook. This information is used to help develop the Annual Assessment. A draft of the Annual Assessment is circulated internally within the District for peer review and comment. Based on comments received, a redraft is prepared and provided to the District managers during the spring of each year. The draft is then provided to the General Manager for final review. Subsequently, a final draft of the Annual Assessment is provided to the District's Board of Directors for review and included in the agenda as part of a Board meeting such that it can be approved, and any recommended specific shortage response actions may be enacted. The final Annual Assessment is provided to DWR no later than July 1 of each year.

The Annual Assessments are instrumental in providing guidance to the District for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process ensures adequate water supplies resources are available to the District.

2.2 DATA AND METHODOLOGIES

The key data inputs and methodologies which will be evaluated by the District during the preparation of the preliminary assessment include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment are identified. The criteria include the key data inputs and methodologies described below. The District compares total demand to total supply to identify potential shortages. If shortages are identified, the District will determine the necessary WSCP level and corresponding reduction.

2) Water Supply: A description of each available water supply source is provided. The descriptions include a quantification of each available water supply source and are based on current production capacities, historical production, UWMPs, and prior water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year prior to any special shortage actions, are reviewed. The review includes factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban Water Supplier Monitoring Reports, existing water shortage levels (see Section 3), and existing water conservation ordinances.

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands during the current year and the upcoming (potential single dry) year are considered and identified. The evaluation includes factors such as estimated water demands, weather, groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.

5) Infrastructure Considerations: The capabilities of the water distribution system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year are considered. Available production capacities (e.g. groundwater well capacities) and distribution system water losses (see Section 2.1.2 of the UWMP) are reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see Section 4.7 of the UWMP), are considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies are described.

The preliminary assessment is prepared by District staff and is reviewed by the District's General Manager. Following the review of the preliminary assessment, the District prepares the Annual Assessment for presentation and approval during a regular scheduled meeting of the District's Board of Directors prior to June 30th of each year. Upon Board approval, District staff formally submits the Annual Assessment to DWR by July 1st of each year. The Annual Assessments are instrumental in providing guidance to the District for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. The District compares total demand to total supply to identify potential shortages. If shortages are identified, the District will determine the necessary WSCP level and corresponding reduction. This process ensures adequate water supplies resources are available to the District.

3. SIX STANDARD WATER SHORTAGE LEVELS

CWC 10632.

(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

The District will manage water supplies prudently to minimize the adverse impacts of water shortages. The District's plan for water usage during periods of shortage is

designed to provide an approach to communicate the severity of water supply shortage conditions. There are six standard water shortage levels corresponding to progressive ranges from up to 10, to greater than 50 percent shortage level. Water shortage trigger mechanisms have been established to ensure that this policy is implemented.

Table 1 provides a description of the six water-shortage levels which may be triggered by a shortage in the District's water supply sources, depending on the severity of the shortage and its anticipated duration.

Table 1. Water Shortage Contingency Planning Levels

Submittal Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions** (*Narrative description*)
1	Up to 10%	Watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to three days per week. All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the District unless other arrangements are made which will include a written plan to address the repairs.
2	Up to 20%	In addition to Shortage Level 1; Additional restrictions may be implemented as determined by the District, after notice to customers.
3	Up to 30%	In addition to Shortage Level 2; Additional restrictions may be implemented as determined by the District, after notice to customers.
4	Up to 40%	Watering or irrigation of lawn, landscape or other vegetated area with potable is limited to two days per week. Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level.
5	Up to 50%	In addition to Shortage Level 4; Additional restrictions may be implemented as determined by the District, after notice to customers.
6	>50%	In addition to Shortage Level 5; watering or irrigation of lawn, landscape or other vegetated area with potable water is prohibited. All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within twenty-four (24) hours of notification by the District unless other arrangements are made with the District which will include written plans that include a timeline of repairs.

NOTES:

The District's previous WSCP, in 2015, contains three (3) standard shortage levels. In accordance with the 2020 UWMP which must include six (6) water shortage levels, a crosswalk has been provided below to illustrate the relationship between the previous

WSCP and the one provided in Table 1. The shortage level changes were made in 2020 and have remained the same for 2025.

Corresponding Relationships Between Supplier's 2015 Shortage Levels and the 2020 WSCP Mandated Shortage Levels

Shortage Level	Supply Condition/Shortage
1	A Level 1 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions.
2	A Level 2 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. A Level 2 Water Supply Shortage includes water conservation measures in addition to those measures included under a Level 1 Water Supply Shortage.
3	A Level 3 condition exists when the District declares a water shortage emergency pursuant to the requirements of California Water Code Sections 71640-71644 and notifies its member agencies, including a direct end user, that a significant reduction in consumer demand is necessary to maintain sufficient water supplies for public health and safety.

2020 Standard Level	Shortage Level
1	≤ to 10%
2	10 to 20%
3	20 to 30%
4	30 to 40 %
5	40 to 50 %
6	> 50 %

Note: The 2020 shortage levels have remained the same for 2025.

4. SHORTAGE RESPONSE ACTIONS

CWC 10632.

(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

4.1 DEMAND REDUCTION

Upon adoption of a water supply shortage stage, as described in Table 1, the restrictions and mandatory water reductions will be effective ten days following the water shortage declaration. A full listing of the restrictions/prohibitions associated with each shortage level is provided below.

Permanent Water Conservation Requirements

The following water conservation requirements are effective and apply to a direct end user at all times during the existence of this Ordinance. Violations of this section will be considered waste and an unreasonable use of water.

a. Limits on Watering Hours: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is prohibited between the hours of 9:00 a.m. and 6:00 p.m. Pacific Standard Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

b. Limit on Watering Duration: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip irrigation systems.

c. No Excessive Water Flow or Runoff: Watering or irrigating of any lawn, landscape or other vegetated area by a direct end user in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.

d. No Washing Down Hard or Paved Surfaces: Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

e. Obligation to Fix Leaks, Breaks or Malfunctions: Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the direct end user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than seven (7) days of receiving notice from the District is prohibited.

f. Re-circulating Water Required for Water Fountains and Decorative Water Features: Operating a water fountain or other decorative water feature that does not use re-circulated water by a direct end user is prohibited.

g. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, by a direct end user is prohibited, except by use of a hand-held

bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device.

h. Drinking Water Served Upon Request Only: Eating or drinking establishments of a direct end user, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

i. Commercial Lodging Establishments Must Provide Guests Option to Decline Daily Linen Services: Hotels, motels, and other commercial lodging establishments and similar facilities of a direct end user must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language.

j. No Installation of Single Pass Cooling Systems: Installation of single pass cooling systems by a direct end user is prohibited in buildings requesting new water service.

k. Restaurants Required to Use Water Conserving Dish Wash Spray Valves: Food preparation establishments of a direct end user, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

l. Reporting Mechanism - Hotline: The District will encourage visitors, students, staff, and faculty of a direct end user to call the District's main telephone number to report violations of this Ordinance.

Level 1 Water Supply Shortage

a. Level 1 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the District of a Level

1 Water Supply Shortage condition, the District will implement the mandatory Level 1 conservation measures identified in this section.

b. Additional Water Conservation Measures: In addition to the prohibited uses of water identified in Section IV of this Ordinance, the following water conservation requirements apply to a direct end user during a declared Level 1 Water Supply Shortage

1. Limits on Watering Days: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is limited to three days per week. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip irrigation systems. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the District unless other arrangements are made which will include a written plan to address the repairs.

Level 2 Water Supply Shortage

a. Level 2 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the District of a Level

2 Water Supply Shortage condition, the District will implement the mandatory Level 2 conservation measures identified in this section.

b. Additional Water Conservation Measures: In addition to the prohibited uses of water identified under the Permanent Water Conservation Requirements and Level 1 Water Shortage Level, the following water conservation requirements apply to a direct end user during a declared Level 2 Water Supply Shortage:

    1. Limits on Watering Days: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is limited to three days per week. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

    2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the District unless other arrangements are made which will include a written plan to address the repairs.

<u>Level 3 Water Supply Shortage</u>

a. Level 3 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the District of a Level

3 Water Supply Shortage condition, the District will implement the mandatory Level 3 conservation measures identified in this section.

b. Additional Water Conservation Measures: In addition to the prohibited uses of water identified under the Permanent Water Conservation Requirements and Water Supply Shortage Level 1 through 2, the following water conservation requirements apply to a direct end user during a declared Level 3 Water Supply Shortage:

    1. Limits on Watering Days: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is limited to three days per week. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

    2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the District unless other arrangements are made which will include a written plan to address the repairs.

<u>Level 4 Water Supply Shortage</u>

a. A Level 4 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the District of a Level

4 Water Supply Shortage condition, the District will implement the mandatory Level 4 conservation measures identified in this section.

b. Additional Conservation Measures: In addition to the prohibited uses of water identified under the Permanent Water Conservation Requirements and Water Supply Shortage Level 1 through 3, the following additional water conservation requirements apply to a direct end user during a declared Level 4 Water Supply Shortage:

   1. Watering Days: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is limited to two days per week. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

   2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the District unless other arrangements are made with the District which will include a written notification by the direct end user of a timeline of repairs.

   3. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds by a direct end user is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this Ordinance.

4. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, by a direct end user is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut- off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.
5. Limits on Filling Residential Swimming Pools & Spas: Re-filling of more than one foot, and initial filling, of residential swimming pools or outdoor spas with potable water by a direct end user is prohibited.

Level 5 Water Supply Shortage

a. A Level 5 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the District of a Level 5 Water Supply Shortage condition, the District will implement the mandatory Level 5 conservation measures identified in this section.
b. Additional Conservation Measures: In addition to the prohibited uses of water identified under the Permanent Water Conservation Requirements and Water Supply Shortage Level 1 through 4, the following additional water conservation requirements apply to a direct end user during a declared Level 5 Water Supply Shortage:
    1. Watering Days: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is limited to two days per week. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation

systems. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the District unless other arrangements are made with the District which will include a written notification by the direct end user of a timeline of repairs.

3. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds by a direct end user is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this Ordinance.

4. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, by a direct end user is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut- off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

5. Limits on Filling Residential Swimming Pools & Spas: Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water by a direct end user is prohibited.

Level 6 Water Supply Shortage

a. A Level 6 Water Supply Shortage condition is also referred to as an "Emergency" condition. A Level 6 condition exists when the District declares a water shortage emergency pursuant to the requirements of California Water Code (CWC) Sections

71640-71644 and notifies its member agencies, including a direct end user, that a significant reduction in consumer demand is necessary to maintain sufficient water supplies for public health and safety. Upon the declaration of a Level 6 Water Supply Shortage condition, the District will implement the mandatory Level 6 conservation measures identified in this section, in addition to any other restrictions, prohibitions, and/or exclusions adopted by the District's Board of Directors in any separate ordinance declaring such emergency.

b. Additional Conservation Measures: In addition to the prohibited uses of water identified under Permanent Water Conservation Requirements and Water Supply Shortage Level 1 through 5, the following water conservation requirements apply to a direct end user during a declared Level 6 Water Supply Shortage Emergency:

    1. No Watering or Irrigating: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is prohibited. This restriction does not apply to the following categories of use, unless recycled water is available and may be applied to the use:

        i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device;

        ii. Maintenance of existing landscape necessary for fire protection;

        iii. Maintenance of existing landscape for soil erosion control;

        iv. Maintenance of plant materials identified to be rare or essential to the well-being of protected species;

        v. Maintenance of landscape within active public parks and playing fields, day care centers, and golf course greens, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Level 4 Water Supply Shortage(b)(1) and

time restrictions in Permanent Water Conservation Requirements(a) and (b)(1);

vi. Actively irrigated environmental mitigation projects.

2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within twenty-four (24) hours of notification by the District unless other arrangements are made with the District which will include written plans that include a timeline of repairs.

3. No New Potable Water Service: Upon declaration of a Level 6 Water Supply Shortage Emergency condition, no new potable water service will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide potable water service (such as, will-serve letters, certificates, or letters of availability) will be issued to a direct end user, except under the following circumstances:

   i. A valid, unexpired building permit has been issued for the project; or

   ii. The project is necessary to protect the public health, safety, and welfare; or

   iii. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.

This provision does not preclude the resetting of turn-on of meters to provide continuation of water service of the restoration of service that has been interrupted for a period of one year or less.

4. Water Allocations and Mandatory Reductions: The District will activate a water allocation process using a method that does not in effect penalize direct end users for prior implementation of conservation methods or installation of water-saving devices. The District will provide notice of

activation of the allocation process to a direct end user pursuant to Section 8.5. Following the effective date of the water allocation, any direct end user using water in excess of the allocation will be subject to a penalty in the amount of double the Tier 2 rate should the water use as allocated for such direct end user fall between 101% to 115% of its individual allocations; and if the water use falls between 116% or higher, the rate will be four (4) times the Tier 2 rate for each billing unit of water in excess of the allocation.

5. Large Landscape Areas – Rain Sensors: Large landscape areas of a direct end user, such as parks, cemeteries, golf course, school grounds, and playing fields, that use landscape irrigation systems to water or irrigate, must use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain or irrigation timers which automatically use information such as evapotranspiration sensors to set an efficient water use schedule.

Table 2. Demand Reduction Actions

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 1 actions is up to 5,240 AF		Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 1 actions is up to 5,240 AF		Yes
2	Other	Collective reduction from all Shortage Level 2 actions is up to 10,479 AF	All actions under Shortage Level 1	Yes
3	Other	Collective reduction from all Shortage Level 3 actions is up to 15,719 AF	All actions under Shortage Level 2	Yes
4	Other	Collective reduction from all Shortage Level 4 actions is up to 20,959 AF	All actions under Shortage Level 3	Yes
4	Water Features - Restrict water use for decorative water features, such as fountains	Collective reduction from all Shortage Level 4 actions is up to 20,959 AF	prohibit filling or refilling ornamental lakes or ponds	Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Collective reduction from all Shortage Level 4 actions is up to 20,959 AF		Yes
4	Other water feature or swimming pool restriction	Collective reduction from all Shortage Level 4 actions is up to 20,959 AF	prohibit initial filling or refilling of more than one foot of residential swimming pools or outdoor spas	Yes
5	Other	Collective reduction from all Shortage Level 5 actions is up to 26,198 AF	All actions under Shortage Level 4	Yes
6	Other	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF	All actions under Shortage Level 5	Yes
6	Landscape - Prohibit all landscape irrigation	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF		Yes
6	Other	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF	No new potable water service	Yes
6	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF		Yes
6	Other	Collective reduction from all Shortage Level 6 actions is up to 26,198 AF	Direct end users that use landscape irrigation systems to irrigate must use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain	Yes

NOTES:

Table 3. Supply Augmentation and Other Actions

Submittal Table 8-2: Demand Reduction Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
	Transfers	Not applicable (see notes)	
1	Transfers	Not applicable (see notes)	
2	Transfers	Not applicable (see notes)	
3	Transfers	Not applicable (see notes)	
4	Transfers	Not applicable (see notes)	
5	Transfers	Not applicable (see notes)	
6	Transfers	Not applicable (see notes)	

NOTES: The District is a wholesale water supplier that provides treated imported water from the State Water Project through MWD to its sub-agencies. The District does not anticipate augmenting water supplies. However, the District's sub- agencies will consider increased production from the Main Basin, Chino Basin, and/or Six Basins (through potential transfer of water rights) using existing facilities to address increased demands. As noted on Table 2, the District plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

8.4.2 SUPPLY AUGMENTATION

As discussed in Chapter 4 of the UWMP, the District's sources of water supply include groundwater produced from the Six Basins and imported water purchased from MWD. The District does not anticipate augmenting water supplies. However, the District's sub-agencies will consider increased supplies from existing sources. Table 3 reflects this approach and does not identify any new supplies. Instead, the District's sub-agencies will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. As noted in Section 2, since July 1, 2022, the District has prepared and submitted an Annual Assessment which includes a review of water supplies available to meet water demands for the current and upcoming years. If the District is currently in, or considers entering into, one of the standard water shortage levels identified in Section 3, the District will consider the water supply (augmentation) actions described below.

For each water shortage level discussed in Section 3, the District will consider supplementing its existing water supplies through purchase of additional imported water supplies. However, due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies, including the

District. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its Municipal and Industrial retail demand. The ratio of MWD water supply drought allocation to local water supply will change based on the WSAP stage. The MWD drought allocation can be used to make full service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any full service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

In addition to the WSAP, MWD describes supply augmentation actions in its Regional 2025 UWMP, which is incorporated by reference. MWD's first response to any gap between core supplies (from the State Water Project (SWP) and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million acre-feet (AF). Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions.

4.3 OPERATIONAL CHANGES

During a water supply shortage situation, the District will manage its water supply resources to provide water supplies to help meet the demands of its member agencies; however, the retail water suppliers ultimately have the responsibility of meeting their customer demands. Section 4.2 describes the District's water supply sources and water supply augmentation actions available. Section 4.1 describes the District's standard water shortage levels and associated demand reduction measures. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in

short-term operational changes which are necessary to allow the District to utilize all available water supply sources in response to water shortage situations.

The operational changes the District will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, analysis, and tracking of water usage to enforce demand reduction measures
- Optimized production from existing available water supply sources (including groundwater and surface water)
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses

4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by the District to reduce sub-agencies' customer demands are discussed in Section 4.1. There are no additional mandatory restrictions planned at this time.

4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in the District's standard water shortage levels (identified in Section 3) and the associated demand reduction measures (described in Section 4.1). In addition to the water supply augmentation actions (Section 4.2) and potential operational changes (Section 4.3) which the District may consider in order to continue providing water supplies, the District will review and implement any necessary steps included in its ERP.

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including the District, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated ERP every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States

Environment Protection Agency (USEPA), confirming the current RRA and ERP have been reviewed and updated. The RRA certification was due by March 31, 2025, and the ERP certification was due by September 30, 2025.

The District's RRA, reviewed and updated in 2025, evaluates the vulnerabilities, threats, and consequences from potential hazards to the District's water system. The District prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and
- Operation and maintenance.

The District's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with the District's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

The District's ERP, reviewed and updated in 2025, provides the management, procedures, and designated actions the District and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures and other unforeseen circumstances. The District's ERP (which is incorporated by reference) provides guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that sub-agencies receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies which directly affect the water system and the ability to maintain safe operations (such as chlorine release, earthquake,

or a threat of contamination). The ERP also incorporates the results of the District's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity
- Plans and procedures for responding to a natural hazard or malevolent act
- Actions and equipment to lessen the impact of a natural hazard or malevolent act
- Strategies to detect natural hazards or malevolent act

The District will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. The District will also review applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC 10632.5.

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

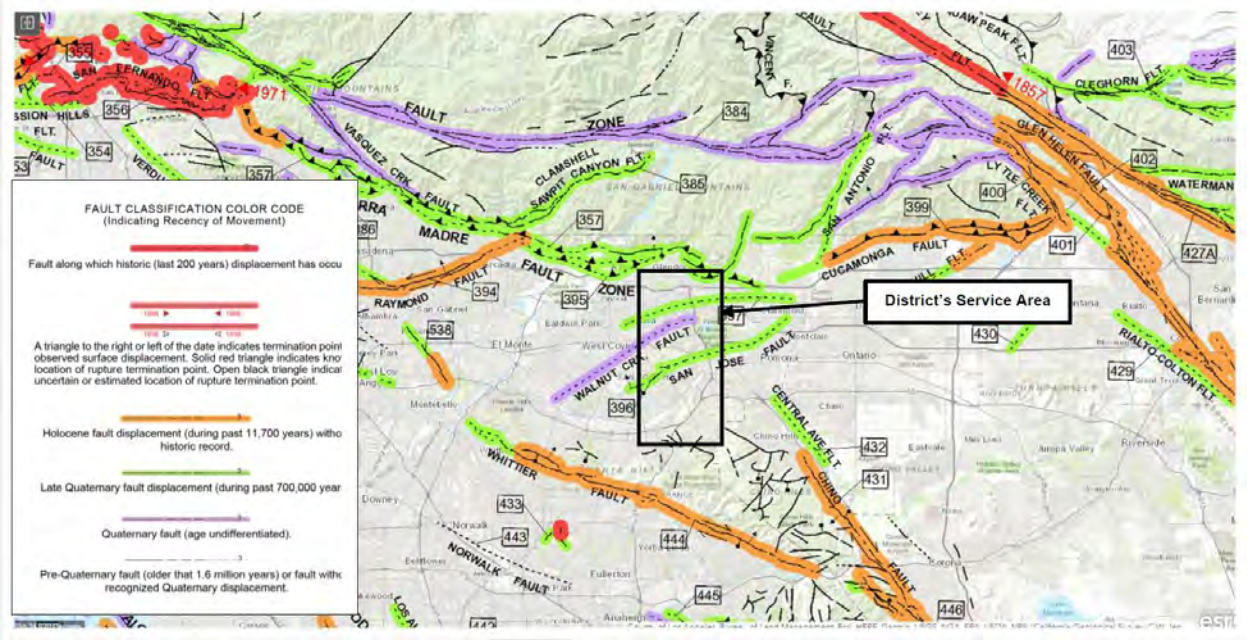
(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

The County of Los Angeles prepared a "All-Hazards Mitigation Plan" in 2025 which identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Los Angeles County, and the mitigation strategies necessary to reduce

risks, including seismic risk. The County's All-Hazards Mitigation Plan is provided in Appendix A.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of the District's water service area are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in the District's water service area include the San Andreas fault, the Walnut Creek fault, the Whittier fault, the San Jose fault, the Cucamonga fault, the Chino fault, the Central Avenue fault, and the Sierra Madre fault.

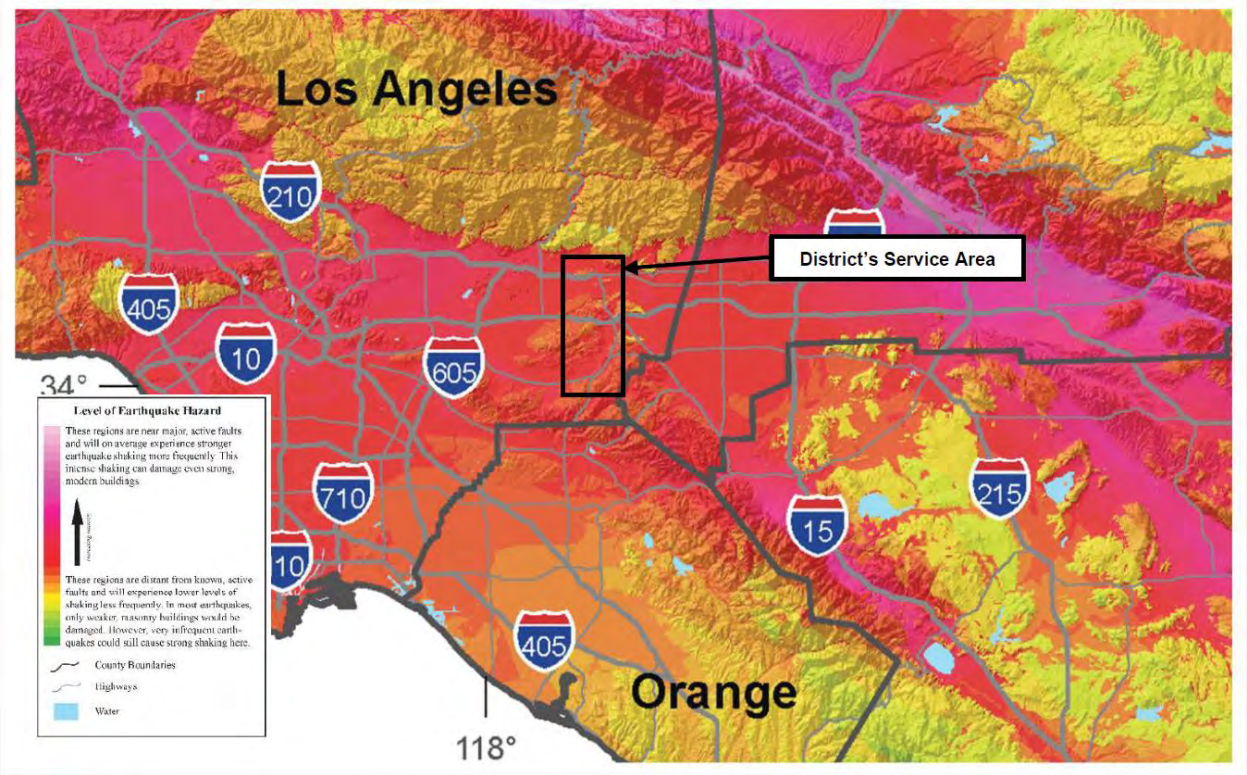
Location of Earthquake Faults



Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of the area receiving water supplies from the District from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including the area receiving water supplies from the District, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 4.5, the District has prepared an Emergency Response Plan which provides the management, procedures, and designated actions the District and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that sub-agencies receive a reliable and adequate supply of potable water. The District's ERP is incorporated by reference.

Earthquake Shaking Potential



Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 3 is evident in the District's historical ability to meet its sub-agencies' water demands during water supply shortages. In addition, the District supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of the District's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3.

During the past 5 years, the District experienced a two-year consecutive drought within the area receiving its water supplies from FY 2021 to FY 2022. Throughout this extended dry period, the District's annual water production averaged 66,443 acre-feet per year (AFY). During the past five years, the average annual production was approximately

55,786 AFY, with a maximum of up to 67,281 AF during FY 2021. The District has been able to provide sufficient water supplies to its sub-agencies, including during long-term droughts and years with historically high water demands. In addition, the District has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

The District's water demands from its sub-agencies during the most recent five years averaged approximately 53,871 AFY. Due to conservation efforts and demand management measures (discussed in Chapter 8 of the UWMP), the District's recent water demands from its sub-agencies have been less than its historical water demands, including during long-term droughts. The District's projected water demands from its sub-agencies (during normal, single dry, and multiple dry years) are provided in Section 5.3 of the UWMP and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. It is anticipated the District will be able to continue providing sufficient water supplies to its sub-agencies to meet projected water demands, including during long-term droughts.

Based on the District's ability in meeting water demands during past water supply shortages, adopted water shortage levels, adjusted operating safe yields, and long-term droughts, it is anticipated that the District will be able to continue providing sufficient water supplies to its customers during any of its standard water shortage levels. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. The District will enact varying levels of its water shortage contingency plan to encourage its sub-agencies to reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of the District's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3. The effectiveness of the District's shortage response actions is based on the District's water demands prior to 2015 (unconstrained demands). The District reduced its water demands in 2015 in response to

the Governor's April 1, 2015, Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. The District's actual water demand reduction during this period was used to estimate the extent of water use reductions for the District's Water Shortage Stages. The District's Water Shortage Levels 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

5. COMMUNICATION PROTOCOLS

CWC 10632.

(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Pursuant to CWC 10632.1, The District's Annual Assessment will be submitted to DWR by July 1 of each year or within 14 days of receiving its final allocation, whichever is later.

The Annual Assessment will provide information on the District's anticipated shortage, triggered response actions, compliance and enforcement actions, and communication actions, as discussed in Section 2. The District may use the Annual Assessment as a method of declaring the appropriate water shortage level.

A water shortage level must first be adopted as a resolution during scheduled District board meetings. In accordance with the District's communication protocol, for each shortage level the District will hold a public hearing to address comments in connection with the adoption of any resolutions declaring a water shortage level. Information

pertaining to the adopted resolution will be provided to the public, customers, interested parties, and local agencies.

The mandatory conservation requirements applicable to the water shortage conditions will take effect on the 10th day after the date the shortage level is declared. Within five (5) days following the declaration of the shortage level, the District will publish a notice of the adoption of the resolution in a local newspaper used for publication of official notices. If the District activates a water allocation process, the District will provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the District customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth day following the date of mailing or at such later date as specified in the notice.

The information provided will include the declared shortage level, response action associated with each shortage level, and any other relevant information relating to the resolution.

6. COMPLIANCE AND ENFORCEMENT

CWC 10632.

(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

As a wholesale agency, the District is not required by DWR to complete Section 6.

7. LEGAL AUTHORITIES

CWC 10632.

(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

CWC Division 1, Section 350

The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

In the event that the demand of water consumers cannot be satisfied without depleting a substantial amount of water supply needed for human consumption, sanitation, and fire protection, the District shall declare a water shortage emergency. The District shall coordinate with any city or county within its service area for possible declaration of a local emergency including the Cities of Claremont, Covina, Diamond Bar, Glendora, Industry, La Verne, Pomona, San Dimas, Walnut, West Covina, and unincorporated areas of Los Angeles County (including Charter Oak and Rowland Heights).

The District adopted Ordinance No. 09-06-17 (“Establishing a Water Conservation and Water Shortage Program and Regulations for its Direct End Service”) in 2009. The ordinance implements measures to ensure effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the District’s service area. In addition, the District must reduce its

demand for imported water to avoid penalties for excessive use and ensure sufficient water supply remain for the health, safety, and welfare of the public. A copy of this ordinance is provided in Appendix B.

In June 2017, the District adopted Resolution No. 17-06-801 declaring a Water Supply Watch. Under a Water Supply Watch, the District coordinated with its sub-agencies in the development of a rate structure to promote water use efficiency and unified regional message to communicate the need for continued water use efficiency to the public, businesses, stakeholder industries and public officials. The District also encouraged its sub-agencies to implement water use efficiency measures to preserve regional storage reserves. A copy of this resolution is provided in Appendix C.

Legal authorities include California Water Code Sections 71640-71644 Article 3. Water Shortages and CA Water Code § 366 (2025) CHAPTER 3.3 - Excessive Residential Water Use During Drought.

The District has developed a WSAP as an approach to control water demand through water rate penalties for excessive use. The WSAP limits how much water can be purchased during the fiscal year without incurring a penalty and is implemented during an extreme shortage stage. The limit varies depending on a number of factors, but mainly local groundwater extracted during the fiscal year. The WSAP is structured with 10 defined shortage level stages that correspond to an annual allocation of water to each of the sub-agencies. The penalties determined in the WSAP are as follows:

- Up to allowed water limit – no penalty is incurred (just the cost of the water)
- Up to 15% above the limit – A penalty of $1,480/AF plus the cost of the water
- Over 15% above the limit – A penalty of $2,960/AF plus the cost of the water

A copy of the WSAP is included in Appendix D.

8. FINANCIAL CONSEQUENCES OF WSCP

CWC 10632.

(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1 (Retail suppliers only).

The expected change in revenues and expenditures to the District can vary due to implementing water shortage response actions from the WSCP. Like most other water agencies, the District experiences a decrease in revenue associated with reduced water sales. The District prepares and updates the water sales forecast annually among its normal budgetary planning activities.

The District has established a Water Rate Stabilization Reserve to help fund operations when water sales are less than projected. This reserve shall be set at an amount to supplant lost income in the event of 10% water sales shortages over a 2-3 period.

The District has other reserve funds that can also be accessed by board approval. These reserve funds are intended to:

- Minimize the impacts of any short-term fluctuations in revenues/expenses without adopting unplanned rate increases
- Provide a safety net in the event of emergency
- Minimize external borrowing and interest expense
- Determine the most opportune time to issue debt when necessary

9. MONITORING AND REPORTING

CWC 10632.

(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

The District is a wholesale water agency only and does not directly provide water to end use customers, and as such, this is not applicable to the District. However, the District will coordinate with its sub-agencies to assist with communication and outreach efforts needed during water shortages. In addition, the District will coordinate with MWD on regional efforts to maximize water use efficiency and mitigate supply limitations.

10. WSCP REFINEMENT PROCEDURES

CWC 10632.

(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

The District's WSCP has been prepared as an adaptive management plan. As discussed in Section 8.9, the District will monitor and report on the implementation of the WSCP. The District will review the implementation results for any current or potential shortage gaps between water supplies and demands. The District will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. The District will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 8 of the UWMP).

- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 4.2).
- Implementation of stricter enforcement actions and penalties (discussed in Section 6).
- Improvements to the water supply augmentation responses (discussed in Section 4.1), as well as any associated operational changes (discussed in Section 4.3) which may be required.
- Incorporation of additional actions recommended by GSWC staff or other interested parties.

The District will use the monitoring and reporting data to evaluate the ability for these potential revisions to resolve any shortage gaps which may occur within the standard water shortage levels.

This WSCP is adopted as part of the District's 2025 UWMP adoption process discussed in Section 9.2. It is anticipated the District will review, revise, and adopt an updated Water Shortage Contingency Plan as part of preparing its 2030 UWMP as necessary. However, the District will continue to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to the District's WSCP will include a public hearing and adoption process by the District's Board (see Section 12).

11. SPECIAL WATER FEATURE DISTINCTION

CWC 10632.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

As a wholesale agency, the District is not required by DWR to complete Section 11.

12. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

CWC 10632.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

CWC 10635.

(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

The District's WSCP is adopted as part of the District's 2025 UWMP adoption process discussed in Chapter 9 of the UWMP. The process for adopting the District's WSCP includes the following:

- The District will conduct a public hearing and make the WSCP available for public inspection.
- The District will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- The District will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- The District's Board will adopt the 2025 UWMP and the WSCP
- As part of submitting the 2025 UWMP to DWR, the District will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2026. The District will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, the District will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

- The District will conduct a public hearing and make the amended WSCP available for public inspection.
- The District's Board will adopt the amended WSCP
- The District will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption
- Within 30 days after submission of the WSCP to DWR, the District will provide the WSCP to any city or county within which the District provides water.

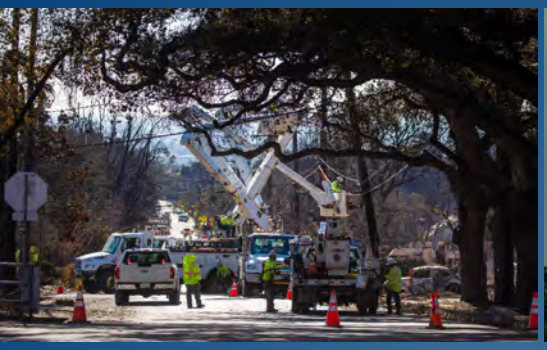
Additional information regarding the adoption, submittal, and availability of the District's WSCP (and 2025 UWMP) is provided in Chapter 9 of the UWMP.

APPENDIX A

LOS ANGELES COUNTY ALL-HAZARD MITIGATION PLAN

2025 County of Los Angeles All-Hazards Mitigation Plan

Chief Executive Office - Office of Emergency Management









Acknowledgement

The Los Angeles County Board of Supervisors gratefully acknowledges the following agencies/jurisdictions who contributed to the development of this plan.

County Departments

Aging and Disabilities
Chief Executive Office
Chief Sustainability Office
Beaches and Harbors
Economic Opportunity
Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

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Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

9/9/25
Date

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1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team
	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

County of Los Angeles
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Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview



Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use



Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

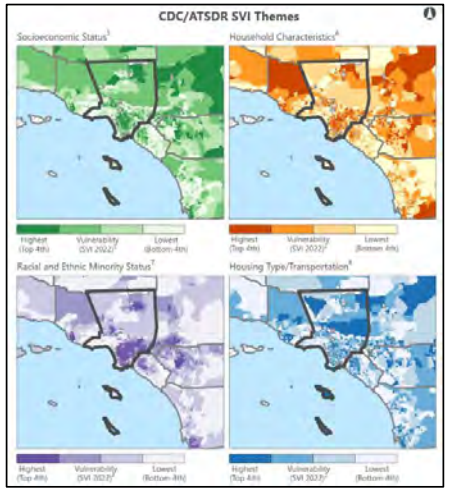


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

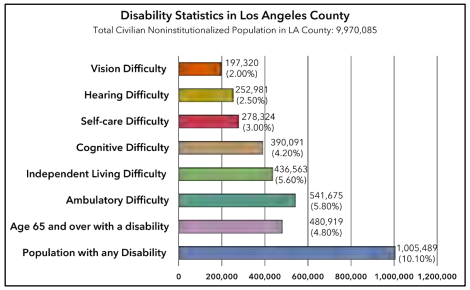


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

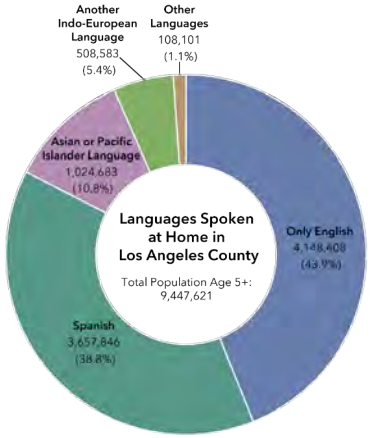


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

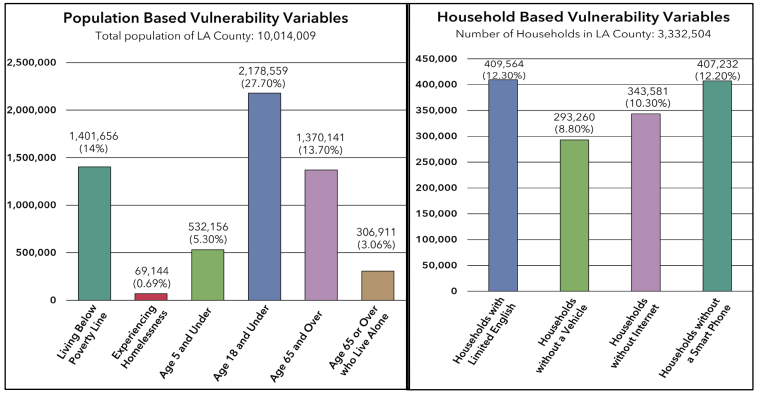


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

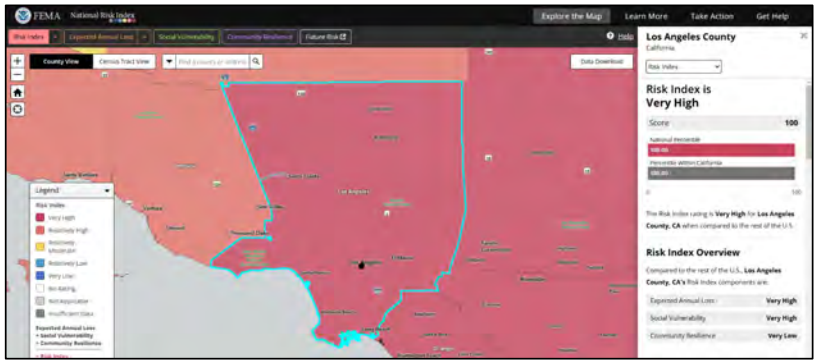


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.

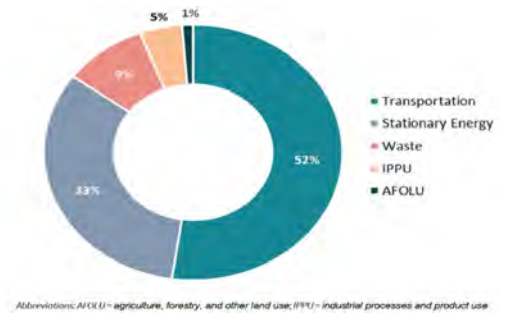


Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
  - Surveys of community needs
  - Consultations with AFN advisory groups
  - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.



- **C-MIST Explanation**
  - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
  - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
  - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
  - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
  - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.



6.2 Wildfire

6.2.1 Nature



Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows—especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD3**: 117.95 sq mi (27.29%)
    - **SD5**: 95.61 sq mi (3.36%)
    - **SD1**: 16.23 sq mi (4.60%)
    - **SD4**: 9.10 sq mi (4.27%)
    - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.



6.3 Earthquake

6.3.1 Nature



Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant. Buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 1,950.78 sq mi (69.50%)
    - **SD3**: 379.41 sq mi (87.99%)
    - **SD1**: 349.17 sq mi (98.95%)
    - **SD2**: 362.95 sq mi (99.99%)
    - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.



6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.



6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	**Figure 6.4.1 Risk of Heat-Related Impacts**
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

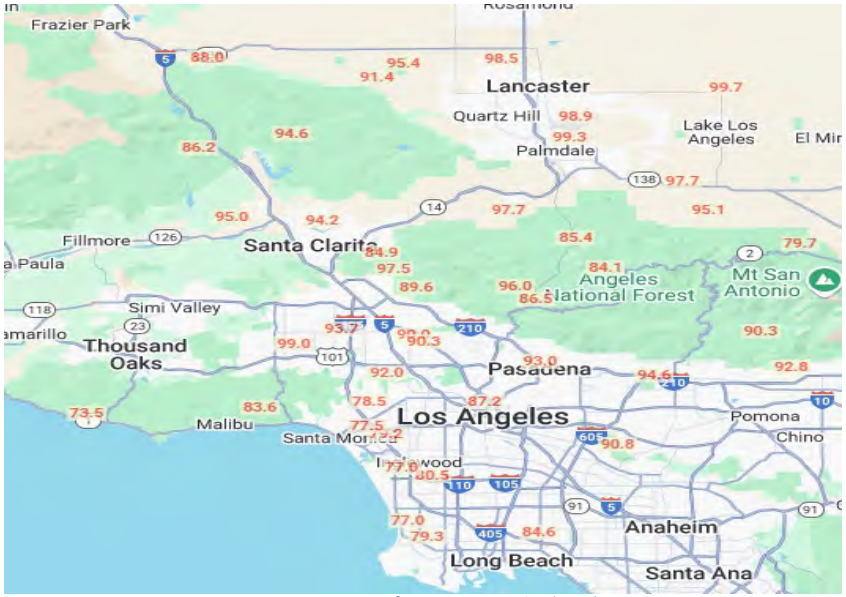


Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.



Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.



6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.



There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

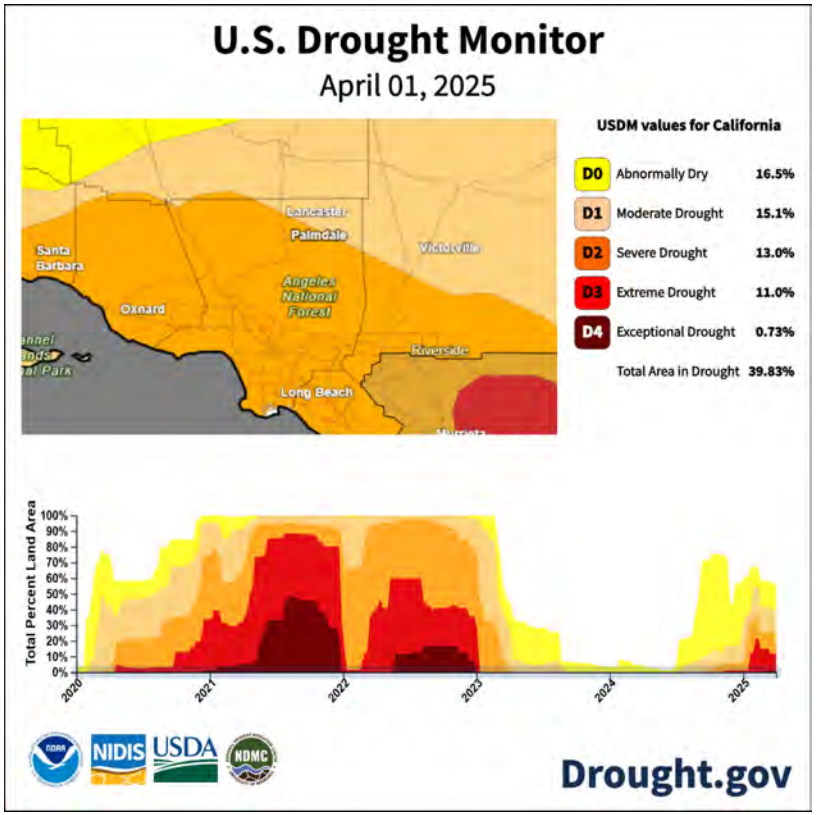


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

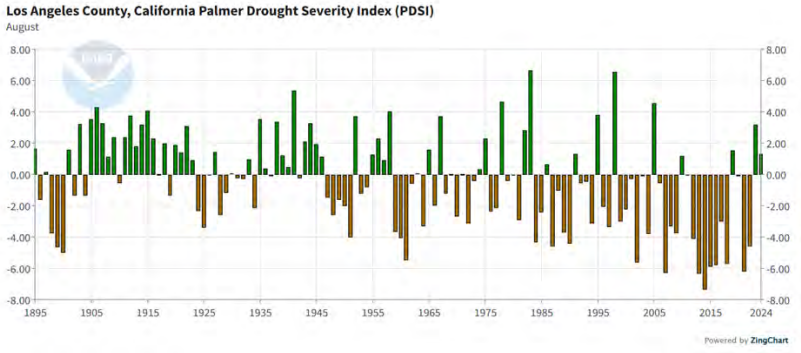


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.



6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.



Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.



6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 223.88 sq mi (7.97%)
    - **SD1**: 162.25 sq mi (45.98%)
    - **SD2**: 66.57 sq mi (18.32%)
    - **SD3**: 25.76 sq mi (5.97%)
    - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
    - Fire Department: 112 (33.22%)
    - Public Works: 92 (40.00%)
    - Health Services: 29 (44.62%)
    - Public Health: 17 (42.50%)
    - Libraries: 30 (34.48%)
    - Parks: 65 (35.50%)
    - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness–making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.



6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.



Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

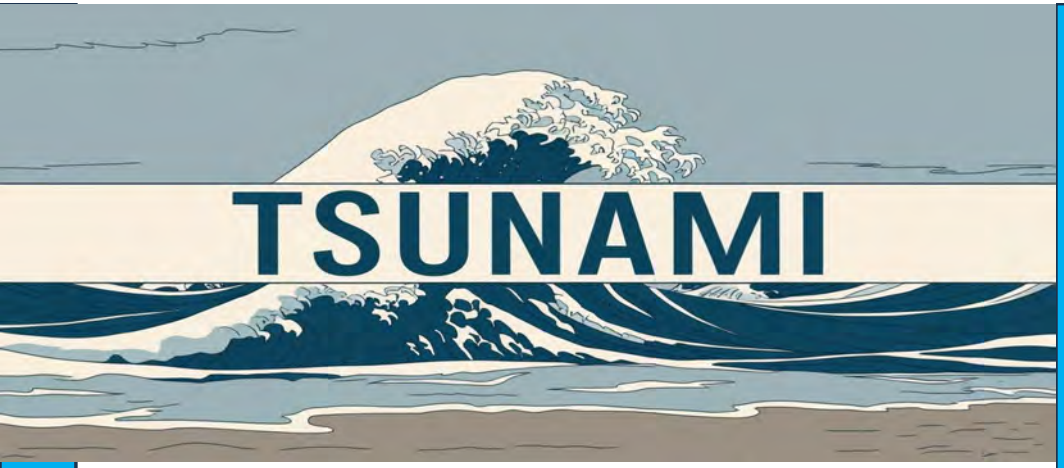
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

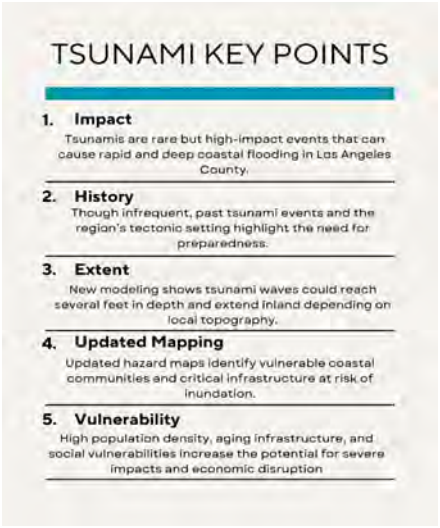
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map—developed using enhanced modeling techniques and updated coastal geomorphology data—highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.



6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.



Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023** (**DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

6.10.9 Summary

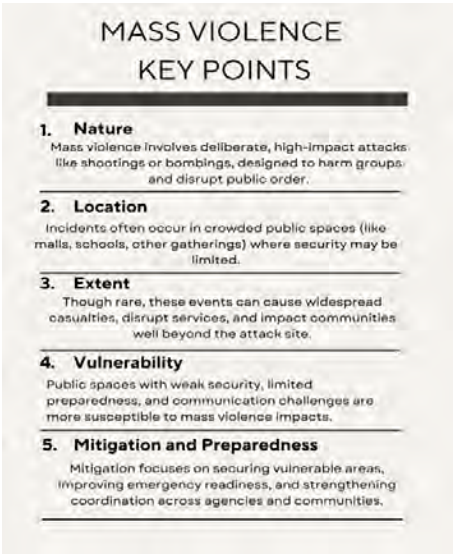
Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.



6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.



- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.



6.12 Cybersecurity Incidents

6.12.1 Nature



Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:

- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents—both in terms of economic impact and service disruption—highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.



6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

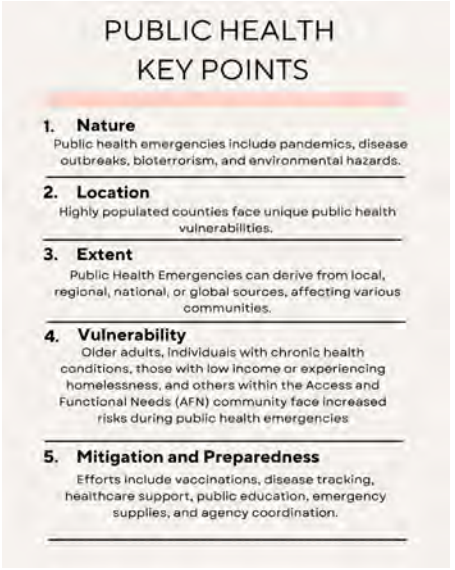
- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.



6.14 Public Health Emergencies

6.14.1 Nature



Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

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7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* **Land Movement** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.	*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**
Source: Los Angeles County Department of Public Works	
Type: Structural and Infrastructure Projects	
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.	*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**
Source: Los Angeles County Department of Public Works, among others.	
Type: Natural Systems Protections	
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.	*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.	*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works	
Type: Education and Awareness Programs	
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.	*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.	*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		*S****evere Wind/Tornado***				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	**Earthquake** **Dam Failure**	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	**Drought**	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	**Drought**	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	**Extreme Heat**	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	**Flooding** **Tsunami**	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	**Mass Violence** **Cyber Incidents**	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	**Mass Violence** **Cyber Incidents**	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	**Mass Violence**	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	**Extreme Heat**	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	**Public Health Emergencies**	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	**Wildfire** **Mass Violence**	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the

incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices

APPENDIX B

WATER CONSERVATION AND WATER SHORTAGE PROGRAM AND REGULATIONS

ORDINANCE NO. 09-06-16

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE THREE VALLEYS MUNICIPAL WATER DISTRICT ESTABLISHING A WATER CONSERVATION AND WATER SUPPLY SHORTAGE PROGRAM AND REGULATIONS FOR ITS DIRECT END SERVICE

WHEREAS, the Board of Directors of the Three Valleys Municipal Water District finds as follows:

A. The Three Valleys Municipal Water District ("District") is a Municipal Water District organized and operating pursuant to California Water Code Section 71000 et seq., and is also a member agency of the Metropolitan Water District of Southern California.

B. The District provides wholesale water service to various retail water purveyors within its jurisdictional boundaries located in the eastern portion of the County of Los Angeles, State of California, and also currently furnishes direct end water service to California State Polytechnic University at Pomona, Mt. San Antonio College, and the Boy Scouts – Firestone Reservation.

C. A reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the Southern California region.

D. Southern California is a semi-arid region and largely dependent upon imported water supplies. A growing population, climate change, environmental concerns, and other factors in within the State and western United States, make the region highly susceptible to water supply reliability issues.

E. Careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs.

F. Article X, Section 2 of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented, and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof.

G. California Water Code Section 374 authorizes water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.

H. California Water Code Section 71610.5 authorizes the District to undertake a water conservation program to reduce water use.

I. On September 18, 2008, the District's Board of Directors adopted Resolution No. 08-09-609 declaring the existence of drought conditions in the San Gabriel Valley and urging greater water conservation and water efficiency by the retail water providers served by the District.

J. The adoption and enforcement of a water conservation and supply shortage program for the District's direct end water service is necessary to manage the District's potable water supply in the short and long-term and to avoid or minimize the effects of drought and shortage within the

District's service area. Such a program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of the Three Valleys Municipal Water District as follows:

Section I. Declaration of Purpose and Intent.

a. The purpose of this Ordinance is to establish a water conservation and supply shortage program for the District's direct end water use that will reduce water consumption within the District's service area through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the District's service area to avoid and minimize the effect and hardship of water shortage to the greatest extent possible.

b. This Ordinance establishes water conservation standards intended to maximize direct end water use efficiency at all times and further establishes three levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

Section II. Definitions.

The following words and phrases whenever used in this Ordinance have the meaning defined in this section:

a. **"Direct end user"** means any corporation, public or private entity, governmental agency or institution, or any other recipient of water directly from the District that is not primarily in the business of reselling such water and/or providing retail water service to any customer.

b. **"Landscape irrigation system"** means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand or through an automated system.

c. **"Large landscape areas"** means a lawn, landscape, or other vegetated area, or combination thereof, equal to more than one (1) acre of irrigable land.

d. **"Single pass cooling systems"** means equipment where water is circulated only once to cool equipment before being disposed.

e. **"Potable water"** means water which is suitable for drinking.

f. **"Recycled water"** means the reclamation and reuse of non-potable water for beneficial use as defined in Title 22 of the California Code of Regulations.

g. **"Billing unit"** means the unit of water used to apply the water rates for purposes of calculating water charges to a direct end user. In this case billing units are equal to acre-feet, or 325,851 gallons.

Section III. Application

a. The provisions of this Ordinance apply only to a direct end user of any potable water provided by the District.

b. The provisions of this Ordinance do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire and other similar emergency services.

c. The provisions of this Ordinance do not apply to the use of recycled water, with the exception of Section IV(a).

d. The provisions of this Ordinance do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops or other vegetation intended for commercial sale.

e. This Ordinance is intended solely to further the conservation of water. It is not intended to implement any provision of federal, State, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff. Refer to the local jurisdiction or Regional Water Quality Control Board for information on any stormwater ordinances and stormwater management plans.

Section IV. Permanent Water Conservation Requirements – Prohibition Against Waste

The following water conservation requirements are effective and apply to a direct end user at all times during the existence of this Ordinance. Violations of this section will be considered waste and an unreasonable use of water.

a. **Limits on Watering Hours**: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is prohibited between the hours of 9:00 a.m. and 6:00 p.m. Pacific Standard Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

b. **Limit on Watering Duration**: Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems.

c. **No Excessive Water Flow or Runoff:** Watering or irrigating of any lawn, landscape or other vegetated area by a direct end user in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.

d. **No Washing Down Hard or Paved Surfaces:** Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, by a direct end user is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

e. **Obligation to Fix Leaks, Breaks or Malfunctions:** Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the direct end user's plumbing or distribution system for any period of time after such escape of water should have reasonably been

discovered and corrected and in no event more than seven (7) days of receiving notice from the District is prohibited.

f. **Re-circulating Water Required for Water Fountains and Decorative Water Features**: Operating a water fountain or other decorative water feature that does not use re-circulated water by a direct end user is prohibited.

g. **Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, by a direct end user is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device.

h. **Drinking Water Served Upon Request Only:** Eating or drinking establishments of a direct end user, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

i. **Commercial Lodging Establishments Must Provide Guests Option to Decline Daily Linen Services**: Hotels, motels, and other commercial lodging establishments and similar facilities of a direct end user must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language.

j. **No Installation of Single Pass Cooling Systems**: Installation of single pass cooling systems by a direct end user is prohibited in buildings requesting new water service.

k. **Restaurants Required to Use Water Conserving Dish Wash Spray Valves**: Food preparation establishments of a direct end user, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

l. **Reporting Mechanism - Hotline**: The District will encourage visitors, students, staff, and faculty of a direct end user to call the District's main telephone number to report violations of this Ordinance.

Section V. Level 1 Water Supply Shortage

a. A Level 1 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the District of a Level 1 Water Supply Shortage condition, the District will implement the mandatory Level 1 conservation measures identified in this section.

b. **Additional Water Conservation Measures:** In addition to the prohibited uses of water identified in Section IV of this Ordinance, the following water conservation requirements apply to a direct end user during a declared Level 1 Water Supply Shortage:

1. **Limits on Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is limited to three days per week. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems. This provision also does not apply to

watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the District unless other arrangements are made which will include a written plan to address the repairs.

Section VI. Level 2 Water Supply Shortage

a. A Level 2 Water Supply Shortage exists when the District determines, in its sole discretion, that due to drought or other water supply conditions, a water supply shortage or threatened shortage exists and a direct end user consumer demand reduction is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the District of a Level 2 Water Supply Shortage condition, the District will implement the mandatory Level 2 conservation measures identified in this section.

b. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Sections IV and V of this Ordinance, the following additional water conservation requirements apply to a direct end user during a declared Level 2 Water Supply Shortage:

1. **Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is limited to two days per week. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the District unless other arrangements are made with the District which will include a written notification by the direct end user of a timeline of repairs.

3. **Limits on Filling Ornamental Lakes or Ponds**: Filling or re-filling ornamental lakes or ponds by a direct end user is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this Ordinance.

4. **Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, by a direct end user is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

5. **Limits on Filling Residential Swimming Pools & Spas:** Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water by a direct end user is prohibited.

Section VII. Level 3 Water Supply Shortage – Emergency Condition

a. A Level 3 Water Supply Shortage condition is also referred to as an "Emergency" condition. A Level 3 condition exists when the District declares a water shortage emergency pursuant to the requirements of California Water Code Sections 71640-71644 and notifies its member agencies, including a direct end user, that a significant reduction in consumer demand is necessary to maintain sufficient water supplies for public health and safety. Upon the declaration of a Level 3 Water Supply Shortage condition, the District will implement the mandatory Level 3 conservation measures identified in this section, in addition to any other restrictions, prohibitions, and/or exclusions adopted by the District's Board of Directors in any separate ordinance declaring such emergency.

b. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Sections IV, V, and VI of this Ordinance, the following water conservation requirements apply to a direct end user during a declared Level 3 Water Supply Shortage Emergency:

1. **No Watering or Irrigating:** Watering or irrigating of lawn, landscape or other vegetated area with potable water by a direct end user is prohibited. This restriction does not apply to the following categories of use, unless recycled water is available and may be applied to the use:

   i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device;

   ii. Maintenance of existing landscape necessary for fire protection;

   iii. Maintenance of existing landscape for soil erosion control;

   iv. Maintenance of plant materials identified to be rare or essential to the well-being of protected species;

   v. Maintenance of landscape within active public parks and playing fields, day care centers, and golf course greens, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Section VI(b)(1) and time restrictions in Section IV(a) and (b)(1);

   vi. Actively irrigated environmental mitigation projects.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the direct end user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the District unless other arrangements are made with the District which will include written plans that include a timeline of repairs.

3. **No New Potable Water Service**: Upon declaration of a Level 3 Water Supply Shortage Emergency condition, no new potable water service will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide potable water service (such as, will-serve letters,

certificates, or letters of availability) will be issued to a direct end user, except under the following circumstances:

i. A valid, unexpired building permit has been issued for the project; or

ii. The project is necessary to protect the public health, safety, and welfare; or

iii. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the District.

This provision does not preclude the resetting of turn-on of meters to provide continuation of water service of the restoration of service that has been interrupted for a period of one year or less.

4. **Water Allocations and Mandatory Reductions**: The District will activate a water allocation process using a method that does not in effect penalize direct end users for prior implementation of conservation methods or installation of water-saving devices. The District will provide notice of activation of the allocation process to a direct end user pursuant to Section VIII of this Ordinance. Following the effective date of the water allocation, any direct end user using water in excess of the allocation will be subject to a penalty in the amount of double the Tier 2 rate should the water use as allocated for such direct end user fall between 101% to 115% of its individual allocations; and if the water use falls between 116% or higher, the rate will be four (4) times the Tier 2 rate for each billing unit of water in excess of the allocation.

5. **Large Landscape Areas – Rain Sensors**: Large landscape areas of a direct end user, such as parks, cemeteries, golf course, school grounds, and playing fields, that use landscape irrigation systems to water or irrigate, must use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain or irrigation timers which automatically use information such as evapotranspiration sensors to set an efficient water use schedule.

Section VIII. Procedures for Determination / Notification of Water Supply Shortage

The existence of Level 1, Level 2, or Level 3 Water Supply Shortage conditions may be declared by resolution of the District's Board of Directors, adopted at a regular or special public meeting held in accordance with State law. The mandatory conservation requirements applicable to Level 1, Level 2, or Level 3 conditions will take effect on the tenth day after the date the shortage level is declared. Within five (5) days following the declaration of the shortage level, the District must publish a notice of the adoption of the resolution in a newspaper used for publication of official notices that serves the District's area. If the District activates a water allocation process, the District will provide notice of the activation by including it in the regular billing statement or by any other mailing to the address to which the District customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth day following the date of mailing or at such later date as specified in the notice.

Section IX. Hardship Waiver

a. **Undue and Disproportionate Hardship:** If, due to unique circumstances, a specific requirement of this Ordinance would result in undue hardship to a direct end user that is disproportionate to the impacts to other direct end users generally, then the direct end user may apply for a waiver to the requirements as provided in this section.

b. **Written Finding:** The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to property upon which water is used, that is disproportionate to the impacts to other direct end users generally.

1. **Application**: Application for a waiver must be on a form prescribed by the District and accompanied by statement describing all of the potential, irreversible impacts limiting water use will create.

2. **Supporting Documentation**: The application must be accompanied by photographs, maps, drawings, and other information, including a signed statement of the applicant.

3. **Required Findings for Waiver:** An application for a waiver will be denied unless the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the District, all of the following:

   i. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other similar direct end users;

   ii. That because of special circumstances applicable to the property or its use, the strict application of this Ordinance would have a disproportionate impact on the direct end user that exceeds the impacts to other direct end users generally;

   iii. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the District to effectuate the purpose of this Ordinance and will not be detrimental to the public interest; and

   iv. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

4. **Approval Authority**: The General Manager of the District must act upon any completed application no later than fifteen (15) working days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the District's General Manager will be final.

Section X. Penalties and Violations

a. **Enforcement**: In order to enforce the provisions of this Ordinance, the District may exercise any and all of the rights and remedies available under the law, including but not limited to those expressly authorized under California Water Code Section 71601.

b. **Penalties:** In addition to all of the means of District enforcement of this Ordinance authorized herein, the penalties for failure to comply with any provisions of the Ordinance are as follows:

1. **First Violation:** The District will issue a written warning and deliver a copy of this Ordinance by mail.

2. **Second Violation:** A second violation within the preceding twelve (12) calendar months will be subject to prosecution. Every person convicted of an infraction for a violation of this Ordinance shall be punished upon a first conviction by a fine not exceeding fifty dollars ($50).

3. **Third Violation:** A third violation within the preceding twelve (12) calendar months will be subject to prosecution. Every person convicted of an infraction for a violation of this Ordinance shall be punished upon a second conviction within a period of one year by a fine not exceeding one hundred dollars ($100).

4. **Fourth Violation:** A fourth and any subsequent violation will be subject to prosecution. Every person convicted of an infraction for a violation of this Ordinance shall be punished upon a third or any subsequent conviction within a period of one year by a fine not exceeding two hundred fifty dollars ($250).

c. **Separate Offenses**: Each day that a violation of this Ordinance occurs is a separate offense.

Section XI. Severability

If any section, subsection, sentence, clause or phrase in this Ordinance is for any reason held invalid, the validity of the remainder of the Ordinance will not be affected. The District's Board of Directors hereby declares it would have passed this chapter and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or is declared invalid.

ADOPTED this 24th day of June, 2009.

ROLL CALL
Ayes: Bowcock, De Jesus, Horan, Kuhn, Mendoza, Ruzicka
Noes: Alvarez
Abstain:
Absent:

_____
Bob G. Kuhn
President, Board of Directors

ATTEST:

_____
Brian Bowcock
Secretary, Board of Directors

APPENDIX C

WATER SUPPLY WATCH

RESOLUTION NO. 17-06-801

A RESOLUTION OF THE BOARD OF DIRECTORS OF THREE VALLEYS MUNICIPAL WATER DISTRICT DECLARING A WATER SUPPLY WATCH

WHEREAS, the state of California is experiencing record wet conditions, with snowpack at approximately 160% of normal in Northern California, and water year 2017 is the wettest year on record over the past several years; and

WHEREAS, the California Department of Water Resources current State Water Project allocation is 85% of contract amounts; and

WHEREAS, despite precipitation, the state of California has endured a severe multi-year drought that continues to impact storage levels of major supplies; and

WHEREAS, Three Valleys Municipal Water District has relied on the guidelines provided through its Resolution No. 14-04-729 in support of a Water Supply Alert; and

WHEREAS, Governor Edmund G. Brown, Jr. declared the drought over on April 4, 2017, and signed Executive Order B-37-16 encouraging water use efficiency and conservation as a way of life in California; and

WHEREAS, Three Valleys MWD relies on the actions of its 14 member agencies to enact and implement local water use efficiency measures;

NOW THEREFORE BE IT RESOLVED, the Board of Directors of Three Valleys Municipal Water District, declares that its service area is in a Water Supply Watch condition;

BE IT FURTHER RESOLVED, that Three Valleys MWD encourages its member agencies to implement water use efficiency measures to preserve regional storage reserves; and

BE IT FURTHER RESOLVED, that Three Valleys MWD will work with its member agencies to identify mechanisms that will encourage and facilitate the adoption of rate structures to promote water use efficiency; and

BE IT FURTHER RESOLVED, that Three Valleys MWD will coordinate with its member agencies in the development of a unified regional message to communicate the need for continued water use efficiency to the public, businesses, stakeholder industries and public officials; and

BE IT FURTHER RESOLVED, that Three Valleys MWD will work with and assist its member agencies to help ensure a reliable near-term and long-term water supply, and to inform its retail water users of the Water Supply Watch conditions, and the need for sustained water use efficiency practices.

BE IT FURTHER RESOLVED, that adoption of this resolution will supersede Resolution No. 14-04-729 in support of a Water Supply Alert.

ADOPTED and **PASSED** at a meeting of the Three Valleys Municipal Water District's Board of Directors, on this 21st day of June 2017 by the following vote:

AYES:
NOES:
ABSTAIN:
ABSENT:

_____
Bob G. Kuhn, President

ATTEST:

_____
Brian Bowcock, Secretary

SEAL:

APPENDIX D

WATER SUPPLY ALLOCATION PLAN



Three Valleys MWD

Water Supply Allocation Plan

July 2015

Introduction

The State of California and the Southern California Region is in the midst of a fourth consecutive year of drought. The average runoff in eight out of the last ten years has been below average and water levels in all of the state's major reservoirs are well below normal. On April 1, 2015, Governor Brown announced the signing of an Executive Order that will establish mandatory water use reductions throughout the state. The executive order directs the State Water Resources Control Board to impose a 25-percent reduction on water use by local water supply agencies.

Critically dry conditions are affecting all of the Metropolitan Water District of Southern California (MWD) water supply sources, and continued legal and regulatory limits further impact the water supplies from the State Water Project. In addition to voluntary efforts already instituted, MWD seeks to manage its current allocations and water reserves to maximize supply reliability for its entire service area. To do this, MWD is instituting an allocation of water to its member agencies, including Three Valleys Municipal Water District (TVMWD).

In 2008, MWD developed the Water Supply Allocation Plan (WSAP) to establish a method of allocating water to its member agencies during periods of supply shortage. The WSAP was implemented during FY 2009-10 and subsequently lifted in the latter part of FY 2010-11. With input from MWD's member agencies, MWD refined the WSAP over the ensuing period, and in December 2014, the MWD Board of Directors adopted a revised WSAP. In April 2015, MWD has again decided to implement the WSAP effective July 1, 2015.

In response to this action by MWD, the TVMWD Water Supply Allocation Plan ("The Plan") was developed for the purpose of implementing the MWD-WSAP within the TVMWD service area in a manner that is fair and equitable to TVMWD's member agencies. The original Plan was adopted in 2009 and its implementation coincided with the implementation of the MWD-WSAP.

The Plan is an extension of the current MWD-WSAP. All WSAP definitions, policies, principles and program provisions are incorporated herein by reference and are considered to be a part of this Plan. A complete copy of the MWD-adopted WSAP is available for reference from TVMWD.

The Plan is consistent with and contributes to the existing TVMWD policies and programs. For example, the Plan's principles encourage development and full utilization of local water resources and extraordinary conservation measures.

Water Supply Allocation Plan Preparation

The process to prepare this Plan has involved the TVMWD member agencies. TVWMD used a consensus-based approach which included monthly member agency manager meetings to discuss the development of a plan as well as several presentations by MWD and industry consultants related to conservation efforts and water supply conditions. The following principles were used to provide guidance for the development and implementation of the TVMWD Plan.

Overall Plan - The Plan was developed in cooperation with the TVMWD member agencies and includes all aspects of drought planning such as allocation planning and methodology, pricing and a conservation communications strategy.

Drought Response – The Plan is consistent with the MWD-adopted WSAP. TVMWD will continue to work with its member agencies in an effort to coordinate the administration of the WSAP to minimize its impact on the member agencies.

Allocation Methodology – The allocation methodology is equitable and contains financial and pricing signals to ensure that member agencies are informed and understand the need to conserve and utilize local water supplies when possible.

Communication Strategy

The preparation of a regional communication strategy is included as a part of the Plan. TVMWD has been coordinating with MWD and its member agencies to develop a unified message to strengthen communication with the public about the serious nature of the ongoing drought and the actions that are needed to manage water demands and ensure a safe and reliable water supply during drought conditions.

The continuance of an ongoing, coordinated and regional public outreach program will serve to provide a clear and consistent message to the public regarding water supplies and specific conservation measures. An outreach program will recognize and support member agency communication efforts that address specific retail level allocations.

Along with the member agencies, TVMWD seeks to establish and coordinate the information that will be provided to the media, public officials and the general public. The communication message should include clear solutions – including easy and inexpensive ways to conserve. It is essential that local print and news media are fully committed to covering the current drought situation.

The communication strategy includes the following components:

- Regular meetings with member agencies and conservation partners to develop and coordinate a regional conservation message.
- Feature advertising on water conservation and conservation tips in the local newspapers.
- Utilization of MWD-funded outreach efforts and coordination of the use of graphics and outreach media buys.
- Participation in forums providing an education of the drought and what lies ahead at the State and local levels.

MWD / TVMWD Water Supply Allocation Quantities

TVWMD is a MWD member agency and will receive a reduced allocation of its normal water supply based on the regional shortage level implemented by the MWD Board in accordance with its adopted WSAP. The allocation methodology is based on the guiding principles and considerations described in MWD's Drought Plan.

MWD uses a two-year (FY 2012-13 and FY 2013-14) average from actual water demand data as the baseline for its calculation of the water supply allocation for its member agencies. TVMWD's Plan uses the same two-year base period for its retail member agencies' allocations. The following table shows the allocation for each corresponding Regional Shortage Level.

TABLE 1
MEMER AGENCY SUPPLY ALLOCATIONS SHOWN AS PERCENTAGE OF TVMWD ALLOCATION FROM MWD

REGIONAL SHORTAGE LEVEL	Boy Scouts	Cal Poly	Covina	Glendora	GSWC (Clrmnt)	GSWC (SD)	LaVerne	Mt. SAC	Pomona	RWD	SWS	VHWC	WVWD
1	0.05%	0.33%	1.52%	3.45%	6.42%	13.07%	9.71%	0.54%	8.34%	17.92%	5.89%	0.07%	32.69%
2	0.05%	0.32%	1.51%	3.39%	6.34%	13.03%	9.70%	0.54%	8.21%	18.04%	5.88%	0.07%	32.91%
3	0.06%	0.32%	1.49%	3.31%	6.26%	12.99%	9.70%	0.55%	8.05%	18.18%	5.87%	0.06%	33.17%
4	0.06%	0.31%	1.47%	3.23%	6.15%	12.94%	9.69%	0.55%	7.88%	18.34%	5.86%	0.06%	33.46%
5	0.06%	0.30%	1.45%	3.14%	6.03%	12.88%	9.68%	0.56%	7.68%	18.52%	5.84%	0.06%	33.79%
6	0.06%	0.29%	1.42%	3.03%	5.90%	12.82%	9.67%	0.56%	7.44%	18.74%	5.82%	0.06%	34.18%
7	0.06%	0.28%	1.39%	2.90%	5.73%	12.74%	9.66%	0.57%	7.17%	18.99%	5.80%	0.05%	34.65%
8	0.06%	0.27%	1.36%	2.75%	5.54%	12.65%	9.65%	0.58%	6.83%	19.30%	5.77%	0.05%	35.20%
9	0.06%	0.25%	1.31%	2.56%	5.30%	12.54%	9.63%	0.59%	6.43%	19.67%	5.74%	0.05%	35.88%
10	0.06%	0.23%	1.25%	2.32%	4.99%	12.40%	9.61%	0.61%	5.91%	20.14%	5.70%	0.04%	36.74%

In its currently-adopted WSAP, MWD includes a methodology to calculate a Conservation Demand Hardening Credit for each member agency. The credit's concept suggests that "member agencies whose customers have implemented conservation savings devices and programs have 'harder' demands than those that have not." Accordingly, an additional supply allocation to such agencies that have conserved may be provided to account for hardened demands resulting from conservation savings. TVMWD's Plan will utilize the methodology within the MWD-WSAP to calculate the Conservation Demand Hardening Credit for each of its retail member agencies that request such credit. This reconciliation is performed at the end of the allocation (fiscal) year. Therefore, an agency will not know if an additional allocation (credit) is due until the allocation year is completed. The Conservation Demand Hardening Credits will be allocated using the same percentages shown in Table 1 above. If TVMWD does not qualify for any Conservation Demand Hardening Credit for the allocation period, no additional allocation will be given to any retail member agency even if it can be shown that they would qualify for the credit.

The MWD-WSAP also provides the ability for certain member agencies to increase its allocation of water based on a justified need to sustain a groundwater basin adversely impacted by drought conditions. If TVMWD is able to secure an additional allocation under this provision of the MWD-WSAP, the total additional amount will be allocated in a manner to be determined later by consensus of the retail member agencies.

Table 2 below shows the estimated quantities of TVMWD's allocation from MWD for each regional shortage level. The values in Table 2 are subject to change based on final calculations established by MWD.

TABLE 2
TVMWD ALLOCATION FROM MWD
BASED ON REGIONAL SHORTAGE LEVEL
(in Acre-Feet)

REGIONAL SHORTAGE LEVEL	ALLOCATION	DEMAND HARDENING CREDIT	REPLENISH ALLOCATION	**TOTAL**
1	60,708	1,159	4,845	**66,712**
2	56,796	1,545	4,590	**62,931**
3	52,884	1,932	4,335	**59,151**
4	48,972	2,318	4,080	**55,370**
5	45,060	2,704	3,825	**51,589**
6	41,148	3,090	3,570	**47,809**
7	37,236	3,477	3,315	**44,028**
8	33,324	3,863	3,060	**40,247**
9	29,412	4,249	2,805	**36,467**
10	25,500	4,636	2,550	**32,686**

The quantities shown are preliminary and subject to change based on final calculations by MWD.

Allocation Penalty Rates

TVMWD will pass through MWD's penalty rates for usage in excess of the shortage allocation at each level. These penalty rates are shown in Table 3 below:

TABLE 3
TVMWD PENALTY RATES ($/AF)

Water Demand		Base Water Rate	Penalty Rate	**Total Rate**
Demand ≤ 100% of Allocation	Tier 1	$918	None	**$918**
	Tier 2	$1,052		**$1,052**
100% Alloc < **Demand** ≤ 115% Alloc	Tier 1	$918	$1,480	**$2,398**
	Tier 2	$1,052		**$2,532**
115% Alloc < **Demand**	Tier 1	$918	$2,960	**$3,878**
	Tier 2	$1,052		**$4,012**

Once the WSAP is implemented by MWD, TVMWD's billing process is expected to remain the same. At the end of any 12-month allocation period (June 30th), TVMWD will receive an invoice from MWD that includes an assessment of penalties if TVMWD's allocation has been exceeded. TVMWD will then look at the total imported water purchases based upon the monthly MWD invoices to TVMWD and determine which agencies have exceeded their individually assigned allocation. Based upon this determination, TVMWD will assess penalties in accordance with its policy on penalty rates and charges. If penalties are incurred, penalty charges will be reflected during the following monthly billing period. Conversely, if no penalties are assessed to TVMWD from MWD after a 12-month allocation period, no penalties will be assessed to any individual retail member agency even if that agency exceeded its individual allocation.

Consistent with current TVMWD practice and the requirements of the WSAP, imported water purchases will be summarized and reported to the retail member agencies and the TVMWD Board on a monthly basis. This information will help TVMWD and its retail member agencies monitor and evaluate water use demands, project annual usage and avoid WSAP penalties where possible. TVMWD will rely on the full cooperation of its retail member agencies to collect monthly water demand and supply information in a timely manner.

Water Supply Allocation Plan Conclusion

The principal objectives in the development of this Plan were to ensure equity and fairness throughout the TVMWD service area. However, due to the complexity of these issues and the possibility that unforeseen circumstances may occur at the MWD and/or local level, TVWMD reserves the right to review and revise the components of this Plan as appropriate.

TVMWD and its member agencies will continue to meet monthly to monitor WSAP performance. After each 12-month period of Plan implementation, TVMWD and its member agencies shall have the opportunity to review and revise the Plan, as needed, in order to correct any merited inequities or to refine any administrative procedures.

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

B

2025 RUWMP Part 4
City of Glendora
Appendix B

B1: UWMP Compliance Checklist

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Part 2 Chapter 2 Part 1 Chapter 3
x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Part 2 Chapter 2 Executive Summary
x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Part 2 Chapter 2
x	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Part 2 Chapter 2 Section 2.1
x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Part 2 Chapter 2
x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Part 2 Chapter 2
x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Part 2 Chapter 2 Section 9 Part 4 Appendix B-2
x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Part 4 Appendix B-2
x	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Part 1 Chapter 5
n/a	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	n/a
x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Part 2 Chapter 2 Section 1.1
x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Part 2 Chapter 2 Section 1.1
x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Part 2 Chapter 2 Section 1.1
x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Part 2 Chapter 2 Section 1.1
x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Part 2 Chapter 2 Section 1.1
x	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Part 2 Chapter 2 Section 2
x	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Part 2 Chapter 2 Section 2.1.3
x	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Part 2 Chapter 2 Section 2.1.3
x	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Part 2 Chapter 2 Section 2.3
x	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Part 2 Chapter 2 Section 2.2

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Part 2 Chapter 2 Section 2.2
x	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Part 2 Chapter 2 Section 2
x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Part 2 Chapter 2 Section 2.4 Part 1 Chapter 5
n/a	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	n/a
x	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Part 2 Chapter 2 Section 3
x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Part 2 Chapter 2 Section 4 Part 1 Chapter 3
x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Part 2 Chapter 2 Section 4 Part 2 Chapter 2 Section 5.3 Part 1 Chapter 5 Section 2
x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Part 2 Chapter 2 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Part 2 Chapter 2 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Part 2 Chapter 2 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Part 2 Chapter 2 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Part 2 Chapter 2 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Part 2 Chapter 2 Section 4.2 Part 1 Chapter 3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Part 2 Chapter 2 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Part 2 Chapter 2 Section 4.8
x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Part 2 Chapter 2 Section 4.8 Part 1 Chapter 3 Part 1 Chapter 5
x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Part 2 Chapter 2 Section 4.6
x	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Part 2 Chapter 2 Section 4.5
x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Part 2 Chapter 2 Section 4.5
x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Part 2 Chapter 2 Section 4.5.1
x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Part 2 Chapter 2 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Part 2 Chapter 2 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Part 1 Chapter Section 5
x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Part 1 Chapter 3 Section 8
x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Part 2 Chapter 1 Section 4.7 Part 1 Chapter 3 Section 9
x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Part 2 Chapter 2 Section 4.9
x	7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Part 2 Chapter 2 Section 5 Part 1 Chapter 3
x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Part 2 Chapter 2 Section 5.3 Part 1 Chapter 5 Section 2
x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Part 1 Chapter 3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Part 2 Chapter 2 Section 2.4 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Part 2 Chapter 2 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Part 2 Chapter 2 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Part 2 Chapter 2 Section 5.1 Part 1 Chapter 5
x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Part 4 Appendix B-7
x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Part 4 Appendix B-7
x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Part 4 Appendix B-7
x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Part 4 Appendix B-7
x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Part 4 Appendix B-7
x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Part 4 Appendix B-7
x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Part 4 Appendix B-7
x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix B-7

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies*.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought*.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Part 4 Appendix B-7
x	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Part 2 Chapter 2 Section 8
n/a	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	n/a
x	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9
x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Part 2 Chapter 2 Section 9 Part 4 Appendix B-2
x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9
x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix B-3
x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Part 4 Appendix B-3
x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix B-3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9
x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9
x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9
x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9
x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9
x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9
x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 2 Section 9

B2: Public Outreach

B2: Attachment 1 – 60-Day Notice of Preparation Letters

Document will be provided upon request through our contact us page.

B2: Attachment 2 – Regional Workshop #1 Materials

Document will be provided upon request through our contact us page.

B2: Attachment 3 – Regional Workshop #2 Materials

Document will be provided upon request through our contact us page.

B3: Adoption Resolution

RESOLUTION CC 2026-27

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GLENDORA ADOPTING THE 2025 URBAN WATER MANAGEMENT PLAN AND DIRECTING THE FILING AND IMPLEMENTATION OF THE PLAN

THE CITY COUNCIL
City of Glendora, California

WHEREAS, the California Legislature established the Urban Water Management Planning Act (Water Code 16010, et seq.) with the enactment of Assembly Bill 797 during the regular 1983-1984 California Legislature Session; and

WHEREAS, the Urban Water Management Planning Act requires that every urban water purveyor that annually supplies more than 3,000 acre-feet or serves more than 3,000 connections must prepare an Urban Water Management Plan which identifies the reliability of their water sources; and

WHEREAS, the Urban Water Management Planning Act requires that said Urban Water Management Plan must be adopted and filed with the California Department of Water Resources following a public hearing and that said Plan shall be reviewed and updated every five years; and

WHEREAS, the City of Glendora, being an urban water purveyor and annually providing water to nearly 13,000 service connections, has therefore prepared an Urban Water Management Plan update and help a properly noticed public hearing in compliance with the Urban Water Management Planning Act; and

WHEREAS, the City Council of the City of Glendora subsequently closed said hearing at its regular meeting of May 26, 2026; and

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENDORA, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. That the 2025 Urban Water Management Plan update is hereby adopted and ordered filed by the City Clerk; and

SECTION 2. That the Public Works Director is hereby authorized and directed to file the 2025 Urban Water Management Plan update with the California Department of Water Resources in accordance with the requirements of the Urban Water Management Planning Act; and

SECTION 3. The City Clerk shall certify to the passage and adoption of this resolution and shall enter the same in the Book of Original Resolutions.

SECTION 4. The City Clerk shall cause this Resolution to be published once within ten (10) days of adoption in a newspaper or general circulation printed and published within the City of Glendora, and shall post a certified copy of the Resolution in established posting locations according to law.

PASSED, APPROVED AND ADOPTED by the City Council of the City of Glendora this 9th day of June, 2026.

BY: DAVID FREDENDALL
Mayor

APPROVED AS TO FORM:
Aleshire & Wynder, LLP
DANNY ALESHIRE
City Attorney

CERTIFICATION

I, do hereby certify that the foregoing Resolution was duly adopted by the City Council of the City of Glendora at a regular meeting held on the 9th day of June, 2026, by the following vote:

AYES:	MEMBERS:	Allawos, Elias, Thompson, Davis, and Fredendall.
NOES:	MEMBERS:	None.
ABSENT:	MEMBERS:	None.
ABSTAIN:	MEMBERS:	None.

I further certify that said Resolution was published as required by law in a newspaper of general circulation in the City of Glendora, California on the 18th day of June, 2026.
Dated: June 12, 2026

KATHLEEN R. SESSMAN
City Clerk/Communications Director

B4: Ordinances

The following ordinances are available online. Select the links to view, Ordinance 1895, Ordinance 1925, and Ordinance 1996.

B5: DWR Tables

Submittal Table 2-1 Retail: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
CA1910044	City of Glendora	13,434	10,113
	Total	**13,434**	**10,113**

Submittal Table 2-2: Plan Identification

Type of Plan	Name of Regional Alliance or RUWMP
Individual UWMP	Three Valleys Regional Urban Water Management Plan

Submittal Table 2-3: Supplier Identification

Type of Supplier	Year Type	Month and date that the year begins (mm/dd)	Units of measure used in UWMP
Supplier is a retail supplier	Fiscal Year	07/01	AF

Submittal Table 2-4 Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use.
Wholesale Water Supplier Name
Three Valleys Municipal Water District
Upper San Gabriel Valley Municipal Water District
Covina Valley Water Company

Submittal Table 3-1 Retail: Population - Current and Projected

Category	2025	2030	2035	2040	2045	2050*(opt)*
Population Served	45,593	45,943	46,294	46,368	46,441	46,515

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual

Use Type	Additional Description (as needed)	2025 Actual Water Use Potable or Non-Potable	2025 Actual Water Use Volume (AF)
Single Family		Potable	6,710
Multi-Family		Potable	445
Commercial		Potable	1,161
Landscape		Potable	343
Sales/Transfers/Exchanges to other Suppliers		Potable	18
Distribution System Water Loss		Potable	1,436
		Subtotal Potable	10,113
		Subtotal Non-Potable	0
		Total	**10,113**

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected

Use Type	Additional Description	Projected Water Use Potable or Non-Potable (Optional)	Projected Water Use 2030 (AF)	Projected Water Use 2035 (AF)	Projected Water Use 2040 (AF)	Projected Water Use 2045 (AF)	Projected Water Use 2050 opt (AF)
Single Family		Potable	6,618	6,535	6,415	6,296	6,180
Multi-Family		Potable	587	580	569	559	548
Commercial		Potable	1,185	1,170	1,148	1,127	1,107
Landscape		Potable	161	159	156	153	151
Sales/Transfers/ Exchanges to other Suppliers		Potable	47	46	45	45	44
Distribution System Water Loss		Potable	1,405	1,388	1,362	1,337	1,312
Subtotal Potable			10,003	9,878	9,695	9,517	9,342
Subtotal Non-Potable			0	0	0	0	0
Total			**10,003**	**9,878**	**9,695**	**9,517**	**9,342**

Submittal Table 4-3 Retail: Inclusion in Water Use Projections

Projection Item	Included in Projections?
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included In Projections?	Yes

Submittal Table 4-5 Retail: Water Loss Audit Reporting

Public Water System ID #	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910044	2020	Yes
CA1910044	2021	Yes
CA1910044	2022	Yes
CA1910044	2023	Yes
CA1910044	2024	Yes
CA1910044	2025	Yes

Notes: Report submittal status for all five years for each Public Water System as available. The "Volume of Water Loss" quantities for FY 2019-20 through FY 2024-25 were obtained from the annual AWWA Water Loss Audits (and based on the combination of apparent losses and real losses). The AWWA Water Loss Audits were reported on a fiscal year basis.

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard

Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System?	Real Water Loss State Water Board Standard 2028 Real Water Loss Standard per Unit per day	Real Water Loss State Water Board Standard Units for Real Water Loss	Real Water Loss Most Recent AWWA Water Loss Audit Number of Units (Connections or Miles corresponding with units selected)	Real Water Loss Most Recent AWWA Water Loss Audit Volume of Total Real Loss (AF) (from AWWA Water Loss Audit)	Real Water Loss Per Unit per Day	Apparent Water Loss State Water Board Standard 2028 Apparent Water Loss Standard per Unit per Day	Apparent Water Loss State Water Board Standard Units for Apparent Water Loss	Apparent Water Loss Most Recent AWWA Water Loss Audit Number of Connections	Apparent Water Loss Most Recent AWWA Water Loss Audit Volume of Total Apparent Loss (AF) (from AWWA Water Loss Audit)	Apparent Water Loss Per Unit per Day
CA1910044	Yes	20.3	Gallons per Service Connection per Day (GPSCD)	13,816	1,660	107.3	13.3	Gallons per Service Connection per Day (GPSCD)	13,816	121	7.8

Water Board's Calculated Water Loss Standards

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress

Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target?	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Actual 2025 GPCD (From SB X7-7 Compliance Form) *	Did Supplier meet the 2020 Target in 2025? *
n/a	n/a	218	194	Yes	198	Yes

Notes: n/a=Not Applicable

***** Only for suppliers that did not meet the Target in 2020

Submittal Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type	Potable or Non-Potable (OPTIONAL)	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Alluvial Basin	Potable	Main Basin	10,709	8,646	7,706	8,103	10,099
		Total	**10,709**	**8,646**	**7,706**	**8,103**	**10,099**

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area

Wastewater Collection Name of Wastewater Collection Agency	Wastewater Collection Wastewater Volume Metered or Estimated? Optional	Wastewater Collection Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Recipient of Collected Wastewater Name of Wastewater Treatment Plant (WWTP) and Place ID Number	Recipient of Collected Wastewater Is WWTP Located Within UWMP Area?
Sanitation Districts of Los Angeles County	Estimated	2,400	San Jose Creek Water Reclamation Plant, Place ID 260156	No
Sanitation Districts of Los Angeles County	Estimated		A.K. Warren Water Resource Facility, Place ID 234156	No
	Total Wastewater Received from UWMP Service Area in 2025:	**2,400**		

Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (Optional)	2025 Volume of Wastewater Received from UWMP Service Area (AF)	Total 2025 Volume of Water Treated (AF)	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Treatment Level	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Volume (AF)	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Treatment Level	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Treatment Level	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Name of other entity
Total		**0**	**0**		**0**		**0**		**0**		**0**		**0**	

Notes: Wastewater was not treated or disposed of within the UWMP service area; therefore, this table was intentionally left blank.

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

Use Type	Potable or Non-Potable (after treatment if treated) (Optional)	Additional Information	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use Volume	Potential Recycled Water Use Narrative page number (Optional)
		Subtotal Potable	0	0	0	0	0	0	0	
		Subtotal Non-Potable	0	0	0	0	0	0	0	
		Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Notes: Recycled water is currently not used and not planned for use within the service area of the supplier; therefore, this table was intentionally left blank.

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual

Use Type	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Total	**0**	**0**

Notes: Recycled water was not used in 2025 nor previously projected for use in 2020, therefore, this table was intentionally left blank.

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
		Total (AF)	**0**
		Unit Conversion to AF	**0**

Notes: The Supplier does not plan to expand recycled water use in the future; therefore, this table was intentionally left blank, and a narrative explanation is provided in Section 4.5.1 of the UWMP.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other suppliers?	If Yes, Supplier Name	Additional Description	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AF)
Development of new extraction well	No		Well #14 Replacement to develop a new extraction well.	Potable	Ongoing	All Year Types	2,000

Notes: There are future water supply projects or programs not compatible with this table, therefore are described in narrative form in Section 4.7 of the UWMP**.**

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Description	2025 Potable or Non-Potable (after treatment if treated) (Optional)	2025 Actual Volume (AF)	2025 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Main Basin	Potable	10,099	
Purchased or Imported Water	Metropolitan Water District - Three Valley Municipal Water District	Potable	14	
Purchased or Imported Water	Covina Valley Water Company	Potable	0	
		Subtotal Potable	10,113	0
		Subtotal Non-Potable	0	0
		Total	**10,113**	**0**

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Projected Water Supply 2030 Reasonably Available Volume (AF)	Projected Water Supply 2030 Total Entitlement (AF) (Optional)	Projected Water Supply 2035 Reasonably Available Volume (AF)	Projected Water Supply 2035 Total Entitlement (AF) (Optional)	Projected Water Supply 2040 Reasonably Available Volume (AF)	Projected Water Supply 2040 Total Entitlement (AF) (Optional)	Projected Water Supply 2045 Reasonably Available Volume (AF)	Projected Water Supply 2045 Total Entitlement (AF) (Optional)	Projected Water Supply 2050 Reasonably Available Volume (AF)	Projected Water Supply 2050 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Main Basin	Potable	9,090		9,018		8,864		8,642		8,357	
Purchased or Imported Water	Metropolitan Water District - Three Valleys Municipal Water District	Potable	906		853		825		867		977	
Purchased or Imported Water	Covina Valley Water Company	Potable	8		8		7		8		9	
		Subtotal Potable	10,004	0	9,879	0	9,696	0	9,517	0	9,343	0
		Subtotal Non-Potable	0	0	0	0	0	0	0	0	0	0
		Total	**10,004**	**0**	**9,879**	**0**	**9,696**	**0**	**9,517**	**0**	**9,343**	**0**

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year	Volume Available (AF)	Percent of Average Supply
Average Year	2021-2025	9,686	100%
Single-Dry Year	2021	11,094	115%
Consecutive Dry Years 1st Year	2018	10,833	112%
Consecutive Dry Years 2nd Year	2019	9,847	102%
Consecutive Dry Years 3rd Year	2020	9,898	102%
Consecutive Dry Years 4th Year	2021	11,094	115%
Consecutive Dry Years 5th Year	2022	10,213	105%

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	10,004	9,879	9,696	9,517	9,343
Use totals	10,004	9,879	9,696	9,517	9,343
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	11,458	11,314	11,105	10,900	10,700
Use totals	11,458	11,314	11,105	10,900	10,700
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison

Year	Total Type / Difference	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	11,188	11,047	10,844	10,644	10,448
	Use totals	11,188	11,047	10,844	10,644	10,448
	Difference	**0**	**0**	**0**	**0**	**0**
Second year	Supply totals	10,170	10,042	9,857	9,675	9,497
	Use totals	10,170	10,042	9,857	9,675	9,497
	Difference	**0**	**0**	**0**	**0**	**0**
Third year	Supply totals	10,223	10,094	9,908	9,725	9,546
	Use totals	10,223	10,094	9,908	9,725	9,546
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth year	Supply totals	11,458	11,314	11,105	10,900	10,700
	Use totals	11,458	11,314	11,105	10,900	10,700
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth year	Supply totals	10,548	10,415	10,223	10,035	9,850
	Use totals	10,548	10,415	10,223	10,035	9,850
	Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment

Totals	2026	2027	2028	2029	2030
Total Water Use (AF)	11,188	10,170	10,223	11,458	10,548
Total Supplies (AF)	11,188	10,170	10,223	11,458	10,548
Difference w/o WSCP Action (AF)	**0**	**0**	**0**	**0**	**0**

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		

Notes: The Supplier uses the standard six levels of water shortage; therefore, supplier-specific shortage levels and percentage ranges are not separately identified in this table.

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (Percentage)	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)
1	Transfers		Not applicable (see notes)	
2	Transfers		Not applicable (see notes)	
3	Transfers		Not applicable (see notes)	
4	Transfers		Not applicable (see notes)	
5	Transfers		Not applicable (see notes)	
6	Transfers		Not applicable (see notes)	

Notes: The City will consider increased production from the Main Basin using existing facilities to address increased demands. As noted on Table 2 of the WSCP, the City plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

Submittal Table 8-3 Retail: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Other - Prohibit use of potable water for washing hard surfaces	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF		Yes
1	CII - Restaurants may only serve water upon request	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF		Yes
1	CII - Lodging establishment must offer opt out of linen service	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF		Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF		Yes
1	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF	Water prohibited from 8am to 5pm	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF	Must repair within 24 hours of notification	Yes
2	Other	Volume	Collective reduction from all Shortage Level 2 actions is up to 2,646 AF	Includes all Stage 1 actions	Yes
3	Other	Volume	Collective reduction from all Shortage Level 3 actions is up to 3,968 AF	Includes all Stage 2 actions	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
3	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 3 actions is up to 3,968 AF		
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Volume	Collective reduction from all Shortage Level 3 actions is up to 3,968 AF		
4	Other	Volume	Collective reduction from all Shortage Level 4 actions is up to 5,291 AF	Includes all Stage 3 actions	Yes
5	Other	Volume	Collective reduction from all Shortage Level 5 actions is up to 6,614 AF	Includes all Stage 4 actions	Yes
6	Other	Volume	Collective reduction from all Shortage Level 6 actions is up to >6,614 AF	Includes all Stage 5 actions	
6	Landscape - Prohibit certain types of landscape irrigation	Volume	Collective reduction from all Shortage Level 6 actions is up to >6,614 AF		
6	Water Features - Restrict water use for decorative water features, such as fountains	Volume	Collective reduction from all Shortage Level 6 actions is up to >6,614 AF		

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
6	Landscape - Other landscape restriction or prohibition	Volume	Collective reduction from all Shortage Level 6 actions is up to >6,614 AF		Yes

Submittal Table 10-1 Retail: Notification to Cities and Counties

City or County Name	60 Day Notice	Notice of Public Hearing
Azusa	Yes	Yes
Covina	Yes	Yes
Diamond Bar	Yes	Yes
Glendora	Yes	Yes
Los Angeles County	Yes	Yes

B6: AWWA Water Audits

The following AWWA Water Audit reports are available online. Select the links below to view each report:

- 2020 AWWA Water Audit
- 2021 AWWA Water Audit
- 2022 AWWA Water Audit
- 2023 AWWA Water Audit
- 2024 AWWA Water Audit
- 2025 AWWA Water Audit

If a link is not available, AWWA Water Audit reports for all years can be downloaded from the WUEdata website.

B7: Water Shortage Contingency Plan

B7: Attachment 1 – Water Shortage Contingency Plan Adoption Resolution

RESOLUTION CC 2026-28

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GLENDORA ADOPTING THE 2025 WATER SHORTAGE CONTINGENCY PLAN AND DIRECTING THE FILING AND IMPLEMENTATION OF THE PLAN

THE CITY COUNCIL
City of Glendora, California

WHEREAS, the Urban Water Management Planning Act requires that every urban water purveyor that annually supplies more than 3,000 acre-feet or serves more than 3,000 connections must prepare a Water Shortage Contingency Plan within the 2025 Urban Water Management Plan, which identifies their best management practices to efficiently use and conserve water; and

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers to conduct an annual water supply and demand assessment (Annual Assessment) each year and to include in their water shortage contingency plans the procedures they use to conduct the Annual Assessment; and

WHEREAS, the City of Glendora, being an urban water purveyor and annually providing water to nearly 13,000 service connections, has therefore prepared a Water Shortage Contingency Plan update and help a properly noticed public hearing in compliance with the Urban Water Management Planning Act; and

WHEREAS, the City of Glendora's water shortage contingency plan provides that by June of each year, City staff will present a completed Annual Assessment for approval by City Council or by the Council's authorized designee with expressly delegated authority for approval of Annual Assessment determinations; and

WHEREAS, the City Council of the City of Glendora subsequently closed said hearing at its regular meeting of May 26, 2026; and

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENDORA, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. That the Water Shortage Contingency Plan within the 2025 Urban Water Management Plan update is hereby adopted and ordered filed by the City Clerk; and

SECTION 2. That the Director of Public Works is hereby authorized and directed to file the Water Shortage Contingency Plan within the 2025 Urban Water Management Plan update with the California Department of Water Resources in accordance with the requirements of the Urban Water Management Planning Act; and

SECTION 3. That the Director of Public Works is hereby authorized and directed to implement the Water Conservation Programs as detailed in the adopted Water Shortage Contingency Plan within the 2025 Urban Water Management Plan update including the recommendations to the City Council regarding the necessary procedures, rules, and regulations to carry out effective and equitable Water Conservation Programs.

SECTION 4. That the City Manager is expressly authorized to approve the Annual Assessment each year.

SECTION 5. The City Clerk shall certify to the passage and adoption of this resolution and shall enter the same in the Book of Original Resolutions.

SECTION 6. The City Clerk shall cause this Resolution to be published once within ten (10) days of adoption in a newspaper or general circulation printed and published within the City of Glendora, and shall post a certified copy of the Resolution in established posting locations according to law.

PASSED, APPROVED AND ADOPTED by the City Council of the City of Glendora this 9th day of June, 2026.

BY: DAVID FREDENDALL
Mayor

APPROVED AS TO FORM:
Aleshire & Wynder, LLP
DANNY ALESHIRE
City Attorney

CERTIFICATION

I, do hereby certify that the foregoing Resolution was duly adopted by the City Council of the City of Glendora at a regular meeting held on the 9th day of June, 2026, by the following vote:

AYES:	MEMBERS:	Allawos, Elias, Thompson, Davis, and Fredendall.
NOES:	MEMBERS:	None.
ABSENT:	MEMBERS:	None.
ABSTAIN:	MEMBERS:	None.

I further certify that said Resolution was published as required by law in a newspaper of general circulation in the City of Glendora, California on the 18th day of June, 2026.
Dated: June 12, 2026

KATHLEEN R. SESSMAN
City Clerk/Communications Director

B7: Attachment 2 – Water Shortage Contingency Plan

2025 WATER SHORTAGE CONTINGENCY PLAN

CITY OF GLENDORA

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AF	Acre-Foot
AFY	Acre-Feet per Year
AMI	Advanced Metering Infrastructure
CII	Commercial, Industrial, and Institutional
City	City of Glendora
CPI	Consumer Price Index
CPUC	California Public Utilities Commission
CVWC	Covina Valley Water Company
CWC	California Water Code
DMM	Demand Management Measure
DWR	California Department of Water Resources
EDRP	Emergency Drought Response Plan
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
GPCD	Gallons Per Capita Per Day
MWD	Metropolitan Water District of Southern California
RRA	Risk and Resilience Assessment
TVMWD	Three Valleys Municipal Water District
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan

WATER SHORTAGE CONTINGENCY PLAN

LAY DESCRIPTION

WATER SHORTAGE CONTINGENCY PLAN

The City of Glendora's (City) 2025 Water Shortage Contingency Plan (WSCP) discusses and provides the following:

- The City's WSCP is a detailed approach which presents how the City intends to act, or respond, in the event of an actual water shortage.
- Preparation of the City's "Annual Water Supply and Demand Assessment" (Annual Assessment) is discussed. Beginning July 1, 2022, the City has submitted the Annual Assessment each year through 2025. The Annual Assessment includes a review of the City's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent the City's water demands prior to any response actions the City may invoke pursuant to the City's WSCP.
- The City will manage water supplies to minimize the adverse impacts of water shortages. The City's plan for water usage during periods of shortage is designed to address six standard progressive water shortage levels including up to 10, 20, 30, 40, and 50 percent shortages, and a greater-than 50 percent shortage.
- For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level.
- For each declared water supply shortage level, the City has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction measures address irrigation, other outdoor use restrictions, and other water use prohibitions.

The operational changes the City will consider in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures. The City's Emergency Response Plan (ERP) is summarized. The ERP provides the management, procedures, and designated actions the City and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.

- The preparation of the City's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of the City's water service area are provided.
- The effectiveness of the shortage response actions for each of the City's standard water shortage levels is presented. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands.
- The communication protocols implemented by the City when it declares any water shortage level are presented.
- The compliance and enforcement procedures associated with City's standard water shortage levels are presented.
- The legal authorities associated with City's standard water shortage levels are presented.
- The financial consequences associated with City's standard water shortage levels are presented.
- The City will evaluate the need for revising the WSCP in order to resolve any water shortage gaps, as necessary. The steps necessary for the City to adopt and amend its WSCP are presented.

1 WATER SUPPLY RELIABILITY ANALYSIS

CWC 10632.

(a)(1) The analysis of water supply reliability conducted pursuant to Section 10635.

The City's sources of supply were discussed in Chapter 4 of the 2025 Urban Water Management Plan (UWMP) and consist of groundwater pumped from the Main San Gabriel Basin (Main Basin); treated, imported surface water purchased from Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD); and, local treated surface water and/or groundwater purchased from Covina Valley Water Company (CVWC). The Main Basin is adjudicated, and groundwater supplies are managed. The reliability of the various sources of supply are discussed in Chapter 5 of the 2025 UWMP. Based on the adjudication provisions in the Main Basin, the City can produce groundwater without limitation, provided an applicable assessment is paid to the Main Basin Watermaster to purchase untreated imported water for groundwater replenishment. Imported water supplies (both treated and untreated) may be impacted in the event MWD implements its Water Supply Allocation Plan (WSAP) due to a water supply shortage.

2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

CWC 10632.

(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

CWC 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before June 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by June 1 of each year, whichever is later.

Beginning July 1, 2022, the City has submitted an Annual Assessment in accordance with Department of Water Resources' (DWR) guidance and requirements. The Annual Assessment includes a review of the City's unconstrained water demands (i.e., water demands prior to any projected response actions the City may trigger under this WSCP)

for the current year and the upcoming (potential single dry) year. The City also includes information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the City's WSCP.

For each Annual Assessment, the City prepares a preliminary assessment which evaluates the adequacy of its water supplies for the current and upcoming years by April of each year. The preliminary assessment includes a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

2.1 DECISION MAKING PROCESS

The City produces groundwater from the Main Basin as its primary source of water supply and that basin is managed on a fiscal year basis. Consequently, during the third quarter of each fiscal year the City reviews its water demands from the initial six months along with the current groundwater basin conditions and local hydrology. This information is used to help develop the Annual Assessment. A draft of the Annual Assessment is circulated internally within the City for peer review and comment. Based on comments received, a redraft is prepared and provided to the City Manager during the Spring of each year. The draft is subsequently provided to the City Manager for final review. Subsequently, a final draft of the Annual Assessment is provided to the City Council for review and included in the agenda as part of a City Council meeting such that it can be approved, and any recommended specific shortage response actions may be enacted. The final Annual Assessment is provided to DWR no later than July 1 of each year.

The Annual Assessments are instrumental in providing guidance to the City for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process ensures adequate water supplies resources are available to the City.

2.2 DATA AND METHODOLOGIES

The key data inputs and methodologies that are evaluated by the City during the preparation of the preliminary assessment includes the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment will be identified. The evaluation criteria includes, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels), current water demands, a review of water system improvement plans which may impact infrastructure availability, and water quality regulations which may impact groundwater availability. The City compares total demand to total supply to identify potential shortages. If shortages are identified, the City will determine the necessary WSCP level and corresponding reduction.

2) Water Supply: A description and available volume of each available water supply source is provided. The descriptions includes a quantification of each available water supply source and is based on a review of current production capacities, historical production, UWMP, and prior water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, are reviewed and calculated as necessary. The review

includes factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban Water Supplier Reports, existing water shortage levels (see Section 3), and existing water conservation ordinances (see Section 8.1.1 of the UWMP).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands during the current year and the upcoming (potential single dry) year are considered and identified by each type of supply. The evaluation includes factors such as estimated water demands, weather, groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.

5) Infrastructure Considerations: The capabilities of the water system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year are considered. Available production capacities (e.g., groundwater well capacities) and distribution system water losses (see Section 2.1.2 of the UWMP) are reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see Section 4.7 of the UWMP), are considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies are described.

3 SIX STANDARD WATER SHORTAGE LEVELS

CWC 10632.

(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.
(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

The City has a legal responsibility to provide water utility services, including water for residential, commercial, industrial, public authority, and for public fire hydrants and private fire services. The City will manage water supplies prudently to minimize the adverse impacts of water shortages. In its 2015 Plan, the City's WSCP was designed to provide a minimum of 50 percent of normal supply during a severe or extended water shortage. Beginning with the 2020 Plan, the City's WSCP is designed to provide water supplies in the event there is less than 50 percent of normal supply during a severe or extended water shortage. Water shortage trigger mechanisms have been established to ensure that this policy is implemented. This includes structured stages of action referred to as water shortage planning levels.

Table 1 on the following page provides a description of the six standard stages of action which may be triggered by a shortage in one or more of the City's water supply sources, depending on the severity of the shortage and its anticipated duration.

Table 1. Water Shortage Contingency Planning Levels

Submittal Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions (*Narrative description*)**
1	Up to 10%	Watering shall be prohibited from 8:00a.m. to 5:00p.m. of any yard, orchard, park, golf course, recreational area, or other area containing vegetation. The use of continuous running water from a hose, pipe, or faucet for the purpose of cleaning buildings and paved, tile, wood, plastic or other surfaces shall be prohibited, except in the event the Director determines that such use is the only feasible means of correcting a potential threat to health, sanitation or safety. Watering with hose equipped will require a self-closing valve that requires operator pressure to activate the flow of water.
2	Up to 20%	In addition to Shortage Level 1, every operator of a hotel, motel, or other commercial lodging establishment shall institute daily washing of towels and linens only upon request and shall post signs in each room notifying customers of the Stage 1 Water Supply Shortage Level.
3	Up to 30%	In addition to Shortage Level 2, the use of water through a meter that is used solely for irrigation purposes shall be prohibited, and the City shall have the right to shut off water service to any such meter with or without notice, as allowed by law. Irrigation is limited to three days a week.
4	Up to 40%	In addition to Shortage Level 3, the private washing of all recreational vehicles and other vehicles shall be prohibited, except using a bucket and hose equipped with a self-closing valve that requires operator pressure to activate the flow of water or except at a facility using reclaimed or recycled water.
5	Up to 50%	In addition to Shortage Level 4, additional restrictions may be implemented as determined by the City, after notice to customers.
6	>50%	In addition to Shortage Level 5, additional restrictions may be implemented as determined by the City, after notice to customers.

The 2025 Plan requires urban water suppliers to have six standardized water shortage levels in accordance with DWR guidance. The City's previous WSCP, originally included in the City's 2015 Plan, was adopted and amended by the City's Ordinance 1895 (see Appendix A), Ordinance 1925 (see Appendix B), and Urgency Ordinance 1996 (see Appendix C). These Ordinances describe a voluntary stage that will allow the City's

customers to voluntarily reduce their consumption by up to 10 percent if the City declares a Voluntary Conservation Drought Condition. If more serious drought conditions occur, these Ordinances describe two water shortage level stages that would be mandatory once put into effect. Stage 1 accounted for up to 25 percent reduction and Stage 2 accounted for up to 50 percent. Under the Urgency Ordinance 1996, the City may declare an emergency drought condition and may impose more severe restrictions to reduce water consumption, along with the restrictions put in place under the original Voluntary Stage, Stage 1, and Stage 2 water shortage levels.

For its 2025 Plan, the City will continue to incorporate the Voluntary Stage during normal water supply conditions. In 2020, the prior Stage 1 was amended into Stage 1 and Stage 2, which address a water supply reduction of up to 10 percent and 20 percent, respectively. The City's prior Stage 2, which accounted for up to 50 percent reduction, was amended into Stage 3, Stage 4, and Stage 5, which address a water supply shortage of up to 30 percent, 40 percent, and 50 percent, respectively. The emergency drought condition described under Urgency Ordinance 1996 will be considered as the Stage 6 water shortage level that will allow the City to address a water supply reduction of more than 50 percent.

A crosswalk of the existing (prior) and current stages of action is shown in the figure below. The shortage level changes were made in 2020 and have remained the same for 2025.

Corresponding Relationships Between Supplier's 2020 Shortage levels and the 2025 WSCP Mandated Shortage Levels

Established Level	Supply Condition/ Shortage
1	≤ 25%
2	25 to 50%
Emergency Shortage	> 50%

2020 Standard Level	Shortage Level
1	≤ 10%
2	10 to 20%
3	20 to 30%
4	30 to 40%
5	40 to 50%
6	> 50%

Note: The 2020 shortage levels have remained the same for 2025.

4 SHORTAGE RESPONSE ACTIONS

CWC 10632.

(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

4.1 DEMAND REDUCTION

Voluntary Water Conservation Drought Condition (Voluntary Stage)

Under Ordinance 1895, the City Council may declare a Voluntary Stage for any period during which the City needs, or projects needing, to import 25 percent or more of its water

supply during any 12-month period. While this Voluntary Stage is in effect, the City will encourage all its consumers to voluntarily reduce their water consumption by at least 10 percent. In order to do so, the City will implement the following program:

1) Educational Outreach:
    a. Public mailings to residents on at least a bi-monthly basis requesting voluntary conservation and offering conservation measures suggestions.
    b. Purchase conservation materials that can be used to educate customers directly or indirectly through community-based organization events.
    c. Inform restaurants and motel/hotel establishments of the need to reduce water offerings. Supply materials and signs to assist with the implementation of voluntary conservation measures.
2) Conservation Capital Program:
    a. Offer a conservation capital program to customers based on similar economic formulas adopted by the California Public Utilities Commission (CPUC).
    b. Offer a conservation capital program to customers based on any program adopted by the California Public Utilities Commission (CPUC) for other water purveyors.

In addition to the Educational Outreach program, the City Manager or their designee is authorized to turn off the water of any property that fails to make corrective changes to any broken water system (e.g., sprinklers) within 72 hours, or as required by law, of being notified by the City by posting in a conspicuous location on the property.

Stage 1 Water Supply Shortage Level (Up to 10%)

A Stage 1 Water Supply Shortage Level may be implemented by the City Council when one or more of the following conditions exist:

1) Imported water is needed to meet 40 percent of the City's water system demand for the current or next fiscal year.

2) The City's water well production for the current fiscal year is reduced by 25 percent below the production level for the same period of the preceding year.
3) Upon recommendation by the Water Commission that a water shortage exists, such as when the projected supply and demand for water reduces storage capacities and/or a reduction in the City's ability to purchase water.

Upon adoption by the City Council of a Resolution declaring a Stage 1 Water Shortage Level and for as long as it is in effect, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

1) Each of the Voluntary Stage regulations shall be applicable if they are not in conflict with the more restrictive regulations of the Stage 1 Water Supply Shortage level.
2) The use of continuous running water from a hose, pipe, or faucet for the purpose of cleaning buildings and paved, tile, wood, plastic or other surfaces shall be prohibited, except in the event the Director determines that such use is the only feasible means of correcting a potential threat to health, sanitation or safety.
3) Every operator of a restaurant providing table service shall offer water only upon request and post table signs notifying its customers of drought conditions and that water is available upon request.
4) Every operator of a hotel, motel, or other commercial establishment offering lodgings shall institute daily washing of towels and linens only upon request and shall post signs in each room notifying customers of the Stage 1 Water Supply Shortage Level.
5) Any use of water that causes runoff to occur beyond the immediate vicinity of use shall be prohibited.
6) Watering shall be prohibited from 8:00 a.m. to 5:00 p.m. of any yard, orchard, park, golf course, recreational area, or other area containing vegetation, with the following exceptions:
    a. The irrigation of trees and shrubs shall be allowed by any means and at any time of the day, provided that:

i. The irrigation shall be confined to the area within the drip line of a tree or shrub.
ii. There shall be no runoff as result of the irrigation.
iii. The irrigation shall not exceed five minutes to each tree or shrub during any 24-hour period.

b. The irrigation of plant material within commercial nurseries shall be allowed at any time of the day provided that:
i. The water is applied only to one plant or container of plants at a time.
ii. The water is applied by means of a hose equipped with an automatic shut-off nozzle.

c. The irrigation of golf course greens and City parks shall be allowed by any means and at any time of the day for the purpose of germinating seed, promoting growth of sod, or leaching minerals from the soil for new growth purposes only.

7) The Director is authorized to turn off the water of any property that fails to make corrective changes to any broken water system (e.g., sprinklers) within 24 hours of being notified by the City by posting in a conspicuous location on the property.
8) When a Stage 1 Water Supply Shortage Level is declared, all consumers shall reduce their water consumption by at least 10 percent below their average consumption for the same period of the previous years, or the year prior to the Stage 1 Water Supply Shortage Level being declared.

Stage 2 Water Supply Shortage Level (Up to 20%)

A Stage 2 Water Supply Shortage Level may be implemented by the City Council when one or more of the following conditions exist:

1) Imported water is needed to meet 40 percent of the City's water system demand for the current or next fiscal year.
2) The City's water well production for the current fiscal year is reduced by 25 percent below the production level for the same period of the preceding year.

3) Upon recommendation by the Water Commission that a water shortage exists, such as when the projected supply and demand for water reduces storage capacities and/or a reduction in the City's ability to purchase water.

Upon adoption by the City Council of a Resolution declaring a Stage 2 Water Shortage Level and for as long as it is in effect, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

1) Each of the Voluntary Stage regulations shall be applicable if they are not in conflict with the more restrictive regulations of the Stage 2 Water Supply Shortage Level.
2) The use of continuous running water from a hose, pipe, or faucet for the purpose of cleaning buildings and paved, tile, wood, plastic, or other surfaces shall be prohibited, except in the event the Director determines that such use is the only feasible means of correcting a potential threat to health, sanitation, or safety.
3) Every operator of a restaurant providing table service shall offer water only upon request and post table signs notifying its customers of drought conditions and that water is available upon request.
4) Every operator of a hotel, motel, or other commercial establishment offering lodgings shall institute daily washing of towels and linens only upon request and shall post signs in each room notifying customers of the Stage 2 Water Supply Shortage Level.
5) Any use of water that causes runoff to occur beyond the immediate vicinity of use shall be prohibited.
6) Watering shall be prohibited from 8:00a.m. to 5:00p.m. of any yard, orchard, park, golf course, recreational area, or other area containing vegetation, with the following exceptions:
    a. The irrigation of trees and shrubs shall be allowed by any means and at any time of the day, provided that:
        i. The irrigation shall be confined to the area within the drip line of a tree or shrub.

ii. There shall be no runoff as result of the irrigation.
iii. The irrigation shall not exceed five minutes to each tree or shrub during any 24-hour period.

b. The irrigation of plant material within commercial nurseries shall be allowed at any time of the day provided that:
   i. The water is applied only to one plant or container of plants at a time.
   ii. The water is applied by means of a hose equipped with an automatic shut-off nozzle.

c. The irrigation of golf course greens and City parks shall be allowed by any means and at any time of the day for the purpose of germinating seed, promoting growth of sod, or leaching minerals from the soil for new growth purposes only.

7) The Director is authorized to turn off the water of any property that fails to make corrective changes to any broken water system (e.g., sprinklers) within 24 hours of being notified by the City by posting in a conspicuous location on the property.
8) When a Stage 2 Water Supply Shortage Level is declared, all consumers shall reduce their water consumption by at least 10 percent below their average consumption for the same period of the previous year, or the year prior to the Stage 2 Water Supply Shortage Level being declared.

Stage 3 Water Supply Shortage Level (Up to 30%)

A Stage 3 Water Supply Shortage Level may be implemented by the City Council when any of the following conditions exist:

1) City well production losses and MWD purchased water restrictions threaten the City's ability to meet system demand.
2) Imported water is needed to meet 60 percent of the system demand.
3) Upon recommendation by the Water Commission that a water shortage exists when the projected supply and demand for water reduces storage capacities and/or the ability to purchase water.

Upon adoption by the City Council of a Resolution declaring a Stage 3 Water Shortage Level and for as long as it is in effect, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

1) Each of the regulations from the preceding Stages shall be applicable as long as they are not in conflict with any more restrictive regulations of the Stage 3 Water Supply Shortage Level.
2) The use of water through a meter that is used solely for irrigation purposes shall be prohibited, and the City shall have the right to shut off water service to any such meter with or without notice, as allowed by law, to the consumer, account holder, or any person, with the following exception:
    a. The watering of any yard, orchard, hillside, park, golf course, recreational area, or other area containing vegetation shall be limited to Monday, Wednesday, and Friday for all even numbered address locations, and Tuesday, Thursday, and Saturday for all odd numbered address locations. Such watering times shall be limited to no more than 5 minutes for each water cycle station and done only between the hours of 5:00 p.m. to 8:00 a.m.
3) The private washing of all recreational vehicles and other vehicles shall be prohibited, except using a bucket and hose equipped with a self-closing valve that requires operator pressure to activate the flow of water or except at facilities using recycled or recirculating water.
4) The City Manager, or their designee, is authorized to discontinue the supply of water to third party water purveyors during a Stage 3 Water Supply Shortage Level.
5) When a Stage 3 Water Supply Shortage Level is declared, all consumers shall reduce their water usage by at least 20 percent below their average usage for the same period of the previous year, or the year prior to the Stage 3 Water Supply Shortage Level being declared.

Stage 4 Water Supply Shortage Level (Up to 40%)

A Stage 4 Water Supply Shortage Level may be implemented by the City Council when any of the following conditions exist:

1) City well production losses and MWD purchased water restrictions threaten the City's ability to meet system demand.
2) Imported water is needed to meet 60 percent of the system demand.
3) Upon recommendation by the Water Commission that a water shortage exists when the projected supply and demand for water reduces storage capacities and/or the ability to purchase water.

Upon adoption by the City Council of a Resolution declaring a Stage 4 Water Shortage Level and for as long as it is in effect, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

1) Each of the regulations from the preceding Stages shall be applicable as long as they are not in conflict with any more restrictive regulations of the Stage 4 Water Supply Shortage Level.
2) The use of water through a meter that is used solely for irrigation purposes shall be prohibited, and the City shall have the right to shut off water service to any such meter with or without notice, as allowed by law, to the consumer, account holder, or any person, with the following exception:
    a. The watering of any yard, orchard, hillside, park, golf course, recreational area, or other area containing vegetation shall be limited to Monday, Wednesday, and Friday for all even numbered address locations, and Tuesday, Thursday, and Saturday for all odd numbered address locations. Such watering times shall be limited to no more than 5 minutes for each water cycle station and done only between the hours of 5:00 p.m. to 8:00 a.m.

3) The private washing of all recreational vehicles and other vehicles shall be prohibited, except using a bucket and hose equipped with a self-closing valve that requires operator pressure to activate the flow of water or except at facilities using recycled or recirculating water.
4) The City Manager, or their designee, is authorized to discontinue the supply of water to third party water purveyors during a Stage 4 Water Supply Shortage Level.
5) When a Stage 4 Water Supply Shortage Level is declared, all consumers shall reduce their water usage by at least 20 percent below their average usage for the same period of the previous year, or the year prior to the Stage 4 Water Supply Shortage Level being declared.

Stage 5 Water Supply Shortage Level (Up to 50%)

A Stage 5 Water Supply Shortage Level may be implemented by the City Council when any of the following conditions exist:

1) City well production losses and MWD purchased water restrictions threaten the City's ability to meet system demand.
2) Imported water is needed to meet 60 percent of the system demand.
3) Upon recommendation by the Water Commission that a water shortage exists when the projected supply and demand for water reduces storage capacities and/or the ability to purchase water.

Upon adoption by the City Council of a Resolution declaring a Stage 5 Water Shortage Level and for as long as it is in effect, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

1) Each of the regulations from the preceding Stages shall be applicable as long as they are not in conflict with any more restrictive regulations of the Stage 5 Water Supply Shortage Level.

2) The use of water through a meter that is used solely for irrigation purposes shall be prohibited, and the City shall have the right to shut off water service to any such meter with or without notice, as allowed by law, to the consumer, account holder, or any person, with the following exception:
    a. The watering of any yard, orchard, hillside, park, golf course, recreational area, or other area containing vegetation shall be limited to Monday, Wednesday, and Friday for all even numbered address locations, and Tuesday, Thursday, and Saturday for all odd numbered address locations. Such watering times shall be limited to no more than 5 minutes for each water cycle station and done only between the hours of 5:00 p.m. to 8:00 a.m.
3) The private washing of all recreational vehicles and other vehicles shall be prohibited, except using a bucket and hose equipped with a self-closing valve that requires operator pressure to activate the flow of water or except at facilities using recycled or recirculating water.
4) The City Manager, or their designee, is authorized to discontinue the supply of water to third party water purveyors during a Stage 5 Water Supply Shortage Level.
5) When a Stage 5 Water Supply Shortage Level is declared, all consumers shall reduce their water usage by at least 20 percent below their average usage for the same period of the previous year, or the year prior to the Stage 5 Water Supply Shortage Level being declared.

Stage 6 Water Supply Shortage Level (> 50%)

A Stage 6 Water Supply Shortage Level may be implemented by the City Council in order to address any emergency water supply condition that occurs and for as long as it exists.

Upon declaration of a Stage 6 Water Supply Shortage Level and for as long as it is in effect, the following water use regulations, and such other regulations as may be adopted

by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

1) Each of the regulations of the preceding Stages shall be applicable as long as they are not in conflict with more restrictive regulations of the Stage 6 Water Supply Shortage Level.
2) All residential users shall reduce their water usage to the Residential Gallons per Capita per Day (R-GPCD) consumption levels set forth and adopted by the City, which will comply with the State of California mandated consumption reduction level regulations.
3) All non-residential users with landscape areas greater than 500 square feet shall reduce their water usage by 25 percent compared to the same billing months from the year 2013.
4) All non-residential users with no or landscape areas 500 square feet or less shall reduce their water usage by 10 percent compared to the same billing months from the year 2013.
5) All outdoor ornamental turf watering shall be limited as follows: A cycle must be complete with water shutoff for at least forty-five minutes before a new cycle can begin.
6) Promotion of water conservation by prohibition of certain actions that would result in misuse and/or waste of water (see Section 8.1 of the UWMP).
7) All operators of hotels, motels, or other commercial establishments offering lodgings shall provide guests with the option of choosing not to have towels and linens laundered daily. The operators of these facilities shall prominently display notice of this option in each guestroom using clear and easily understood language and ensure such notices are maintained.
8) The application of potable water to driveways and sidewalks.
9) The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
10) The application of potable water to outdoor landscapes during and within forty-eight hours after measurable rainfall.

11) The irrigation with potable water of ornamental turf on public street medians.
12) The irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
13) When a Stage 6 Water Supply Shortage Level is declared, all consumers shall reduce their water usage by at least 25 percent below their average usage for the same period of the previous year, or the year prior to the Stage 6 Water Supply Shortage Level being declared.

Table 2 summarizes the City's planned water use restrictions and conservation actions by shortage level, showing how the City will reduce water demand during different stages of a water shortage.

Table 2. Demand Reduction Actions

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Other - Prohibit use of potable water for washing hard surfaces	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF		Yes
1	CII - Restaurants may only serve water upon request	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF		Yes
1	CII - Lodging establishment must offer opt out of linen service	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF		Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF		Yes
1	Landscape - Limit landscape irrigation to specific times	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF	Water prohibited from 8am to 5pm	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 1 actions is up to 1,323 AF	Must begin repair within 24 hours of notification	Yes

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
2	Other	Collective reduction from all Shortage Level 2 actions is up to 2,646 AF	Includes all Stage 1 actions	Yes
3	Other	Collective reduction from all Shortage Level 3 actions is up to 3,968 AF	Includes all Stage 2 actions	Yes
3	Landscape - Limit landscape irrigation to three specific days	Collective reduction from all Shortage Level 3 actions is up to 3,968 AF		Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Collective reduction from all Shortage Level 3 actions is up to 3,968 AF		Yes
4	Other	Collective reduction from all Shortage Level 4 actions is up to 5,291 AF	Includes all Stage 3 actions	Yes
5	Other	Collective reduction from all Shortage Level 5 actions is up to 6,614 AF	Includes all Stage 4 actions	Yes
6	Other	Collective reduction from all Shortage Level 6 actions is up to >6,614 AF	Includes all Stage 5 actions	Yes
6	Landscape - Prohibit certain types of landscape irrigation	Collective reduction from all Shortage Level 6 actions is up to >6,614 AF		Yes
6	Water Features - Restrict water use for decorative water features, such as fountains	Collective reduction from all Shortage Level 6 actions is up to >6,614 AF		Yes
6	Landscape - Other landscape restriction or prohibition	Collective reduction from all Shortage Level 6 actions is up to >6,614 AF		Yes

NOTES: The City will consider increased production from the Main Basin using existing facilities to address increased demands. As noted, the City plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

4.2 SUPPLY AUGMENTATION

The City does not plan to add a new source of water supply to address customer demands but instead will consider increased supplies from existing sources. Table 3 reflects this approach and does not identify any new supplies. Instead, the City will focus on demand reduction measures in the event that existing sources of supply are not sufficient to meet customer demands. As discussed in Chapter 4 of the UWMP, the City's sources of water supply include: groundwater pumped from the Main Basin; treated, imported surface water purchased from MWD through TVMWD; and local treated surface water and/or groundwater purchased from CVWC. As noted in Section 2, beginning July 1, 2022, the City has prepared and submitted an Annual Assessment which includes a review of water supplies available to meet water demands for the current and upcoming years. In the event the City is currently in, or considers entering into, one of the standard water shortage levels identified in Section 3, the City will consider the water supply augmentation actions described below.

For each water shortage level discussed in Section 3, the City will consider supplementing its existing water supplies through increased groundwater production instead of the purchase of additional imported water supplies. Due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies, including TVMWD. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its M&I retail demand. The ratio of MWD water supply drought allocation to local water supply will change based on the WSAP stage. The MWD drought allocation can be used to make Full Service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any Full Service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

In addition to the WSAP, MWD describes supply augmentation actions in its Regional 2025 UWMP, which is incorporated by reference. MWD's primary first response to any gap between core supplies (from the State Water Project and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs, including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million acre-feet (AF). Pursuant to MWD's "Emergency Storage Objective," updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and ongoing water supply and storage programs and management practices, the City will use up to the treated imported water supply made available from MWD through TVMWD in association with each of the standard water shortage levels identified in Section 3. Water demands will be addressed through increased use of the local groundwater supplies and implementation of demand reduction measures through the various stages of action.

The City will consider augmenting its existing water supplies through the production of additional groundwater from the Main Basin. The Main Basin is managed by the Main Basin Watermaster. During the period of management under the Main Basin Judgment, significant drought events have occurred. In each drought cycle, the Main Basin has been managed to maintain water levels. Parties to the Main Basin Judgment, including the City, are authorized to produce groundwater in excess of their rights and pay assessments for such production to the Main Basin Watermaster. The assessments are used to purchase untreated imported water to replenish the Main Basin. The Main Basin Watermaster purchases untreated imported water to replenish the Main Basin from MWD through TVMWD. Groundwater quality is carefully monitored and managed by the Main Basin Watermaster. Treatment facilities and/or blend plans have been developed by water

agencies to meet potable water standards and to prevent the spread of any groundwater contamination. Groundwater quality in the Main Basin is not expected to impact potable supplies or constrain supply reliability. Based on historical and ongoing management practices, the City will be able to continue relying on the Main Basin for adequate supplies in response to each of the standard water shortage levels identified in Section 3.

Table 3. Supply Augmentation and Other Actions

Submittal Table 8-2: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Transfers	Not applicable (see table 2)	
2	Transfers	Not applicable (see table 2)	
3	Transfers	Not applicable (see table 2)	
4	Transfers	Not applicable (see table 2)	
5	Transfers	Not applicable (see table 2)	
6	Transfers	Not applicable (see table 2)	

4.3 OPERATIONAL CHANGES

During a water supply shortage situation, the City will manage its water supply resources to provide sufficient water supplies capable of meeting the demands of its customers. Section 4.1 describes the City's standard water shortage levels and associated demand reduction measures. Section 4.1 describes the City's water supply sources and water supply augmentation actions available. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in short-term operational changes which are necessary to allow the City to utilize all available water supply sources in response to water shortage situations.

As noted in Section 2, beginning July 1, 2022, the City has prepared and submitted an Annual Assessment, which includes a review of the water supplies available to meet water demands for the current and upcoming years. Preparation of the Annual Assessment assists the City in determining any potential operational changes. In addition,

the City's standard water shortage levels and the associated demand reduction measures, in conjunction with the City's existing Demand Management Measures (DMM) (discussed in Chapter 8 of the UWMP), will be essential to the City in reducing water demands during any water shortage period. The operational changes the City will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- Optimized production from existing available water supply sources.
- Potential use of emergency supply sources, including emergency interconnections.
- Potential blending of water supply resources.
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses.

4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions that are implemented by the City to reduce customer demands are discussed in Section 4.2. There are no additional mandatory restrictions planned at this time.

4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in the City's standard water shortage levels (identified in Section 3) and the associated demand reduction measures (described in Section 4.2). In addition to the water supply augmentation actions (Section 4.1) and potential operational changes (Section 4.3) that the City may consider in order to continue

providing sufficient water supplies, the City will review and implement any necessary steps included in its ERP.

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including the City, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated ERP every five (5) years. However, due to security concerns regarding the submission of these reports, water systems are required to submit certifications to the United States Environmental Protection Agency (USEPA), confirming the current RRA and ERP have been reviewed and updated. For the City, the RRA certification was due by December 31, 2025, and the ERP certification is due by June 30, 2026.

The City's RRA evaluates the vulnerabilities, threats, and consequences from potential hazards to the City's water system. The City prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage, and distribution facilities, and electronic, computer, and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and
- Operation and maintenance.

The District's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats to estimate the potential "monetized risks" (i.e., associated economic consequences to both the water system and the surrounding region, and the likelihood of

occurrence) associated with the City's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

The City's ERP, which is currently being reviewed and updated, provides the management, procedures, and designated actions the City and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances. The City's ERP (which is incorporated by reference) provides guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies that directly affect the water system and the ability to maintain safe operations (such as a chlorine release, an earthquake, or a threat of contamination). The ERP also incorporates the results of the City's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity.
- Plans and procedures for responding to a natural hazard or malevolent act.
- Actions and equipment to lessen the impact of a natural hazard or malevolent act.
- Strategies to detect natural hazards or malevolent act.

The City will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. The City will also review applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC 10632.5.

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

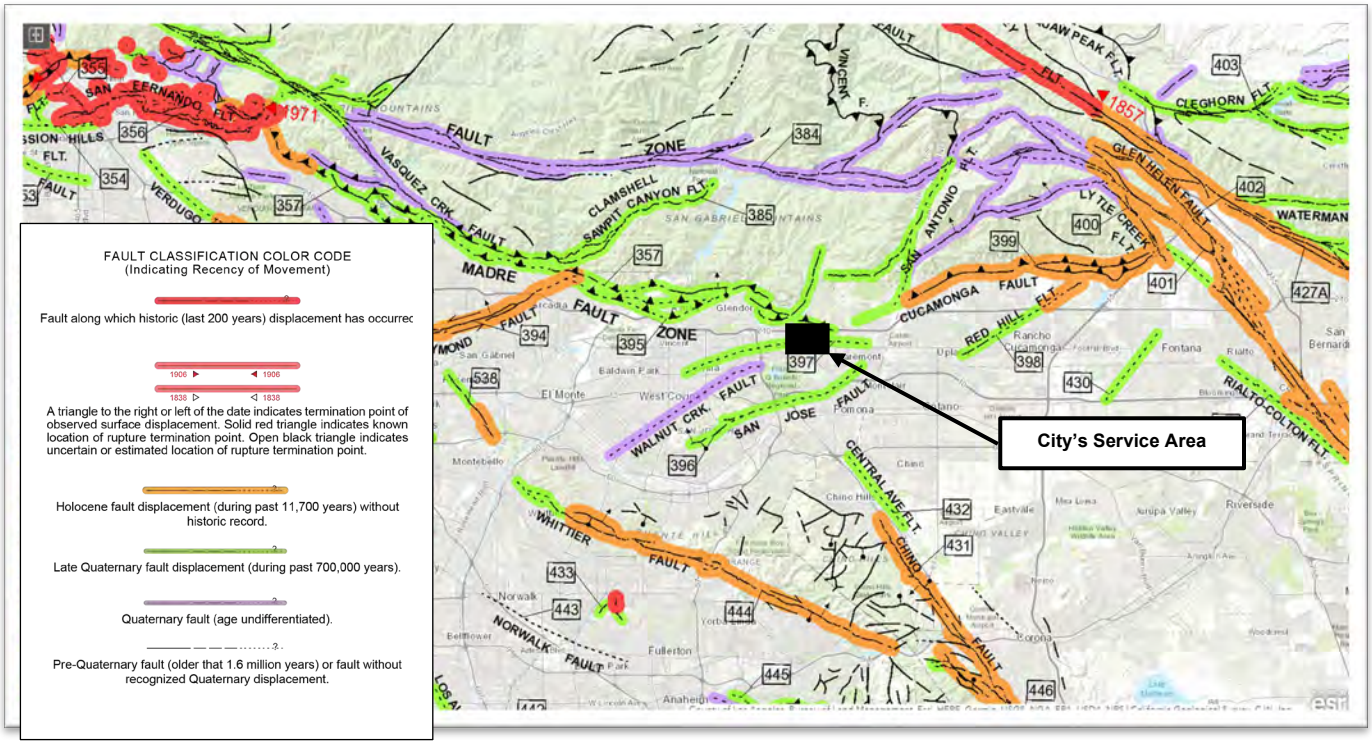
(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

The City prepared a local "Hazard Mitigation Plan" which was approved by the Federal Emergency Management Agency (FEMA) in 2025. The Hazard Mitigation Plan identifies effective ways to assess the significant natural hazards (including earthquakes) that may affect the City and its residents. The Hazard Mitigation Plan provides resources, information, and strategies to reduce the City's vulnerability to these hazards, while providing guidance for the coordination of mitigation activities throughout the City. The Hazard Mitigation Plan includes mitigation projects necessary to reduce seismic risk to the City's water distribution system facilities (including its distribution system pipelines, groundwater wells, booster pumps, and storage reservoirs) and potential disruptions in providing water service. The City's Hazard Mitigation Plan is provided in Appendix D.

The County of Los Angeles prepared a "All-Hazards Mitigation Plan" in 2025 which identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Los Angeles County, and the mitigation strategies necessary to reduce risks, including seismic risk. The County's All-Hazards Mitigation Plan is provided in Appendix E.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of the City's water service area are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in the City's water service area include the San Andreas fault, the Walnut Creek fault, the San Jose fault, the Red Hill fault, the Raymond fault, the Cucamonga fault, the Sierra Madre fault, and the San Antonio fault.

Location of Earthquake Faults

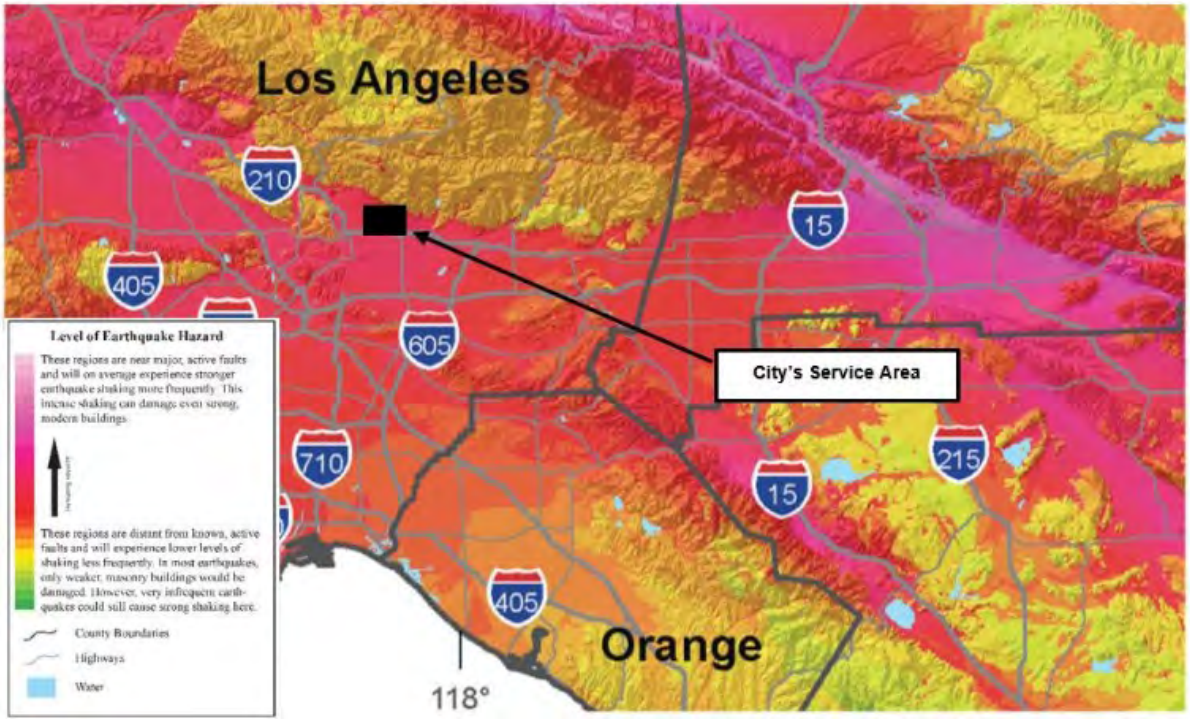


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of the City's service area from anticipated future earthquakes. The locations of relatively long-

period (1.0 second) earthquake shaking, including the City's service area, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 4.5, the City has prepared an Emergency Response Plan which provides the management, procedures, and designated actions the City and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers receive a reliable and adequate supply of potable water. The City's ERP is incorporated by reference.

Earthquake Shaking Potential



Source: "Earthquake Shaking Potential for California," 2016, California Geological Survey and United States Geological Survey

4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 3 is evident in the City's historical ability to meet its customer's water demands in response to a water supply shortage. In addition, the City imposes water consumption regulations and restrictions and supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of the City's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3.

During the past 5 years, the City experienced a consecutive two-year drought within its service area from FY 2021 to FY 2022. Throughout this extended dry year period, the City's annual water production averaged 10,654 acre-feet per year (AFY). During the past five years, the average annual production was approximately 9,686 AFY, with a maximum of up to 11,094 AF during FY 2021. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, the City has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

The City's water demands during the most recent five years averaged approximately 8,373 AFY of potable water. Due to conservation efforts and demand management measures (discussed in Chapter 8 of the UWMP), the City's recent water demands have been significantly less than its historical water demands, including during long-term droughts. The City's projected water demands (during normal, single dry, and multiple dry years) are provided in Section 5.3 of the UWMP and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. It is anticipated the City will be able to continue providing sufficient water supplies to its customers to meet projected water demands, including during long-term droughts. In addition, as discussed in Section 4.1, based on historical and on-going management practices, the City will be able to continue relying on its water supply source from the Main Basin for adequate supply

augmentation in response to each of the standard water shortage levels identified in Section 3.

Based on the City's demonstrated ability to meet water demands during past water supply shortages, the adopted water shortage levels, the adjusted operating safe yields, and water supplies during long-term droughts, it is anticipated that the City will be able to provide sufficient water supplies to its customers during each of its standard water shortage levels. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. The City will enact varying stages of its WSCP to encourage retail customers to reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of the City's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction section provided in Table 2 and Table 3. The effectiveness of the TVMWD's shortage response actions is based on the City's water demands prior to 2015 (unconstrained demands). The City reduced its water demands in 2015 in response to the Governor's April 1, 2015 Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. During this period, the City was able to reduce its water demands by approximately 33 percent. This historical water demand reduction was used to estimate the extent of water use reductions for the City's Water Shortage Stages. The City's Water Shortage Stages 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

5 COMMUNICATION PROTOCOLS

CWC 10632.

(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Using the same procedure established under the City's Ordinance 1925, the City Council will hold a public hearing for the purposes of determining whether a need to implement a Stage 1, Stage 2, Stage 3, Stage 4, Stage 5, or Stage 6 Water Supply Shortage exists. Notice of the time and place of this public hearing will be published no less than 10 days before the hearing in a daily newspaper of general circulation within the City. Upon finding that a need to implement a Stage 1 through Stage 6 Water Supply Shortage exists, the City Council will order implementation of the appropriate water shortage condition, or other measures which it deem appropriate to address the water shortage. The order will be made by Resolution and will be published one time only in a daily newspaper of general circulation and will become effective immediately following publication. The appropriate regulations that fall under the Stage Level declared will take effect with the first full billing period commencing on or after the effective date of the City Council's Resolution. Once a Water Supply Shortage stage is implemented, consumers will receive notification through water bill inserts, flyers sent in the mail, social media postings, and postings made on the City's website.

At any time during the water shortage condition period, the City Council may discontinue the Stage Level or may implement another Stage Level described in the City's WSCP.

Once the City Council finds that a water shortage condition no longer exists, the Stage Level that has been implemented will no longer be in effect.

Using the same procedure established under the City's Urgency Ordinance 1996, if the City Council finds that a water shortage emergency exists, the City Council may order a Stage 6 Water Supply Shortage Level, or other measures which it deems appropriate to address the water shortage emergency. The order will be made by Resolution and shall be published one time only in a daily newspaper of general circulation within the City. Upon the effective date of the City Council's Resolution, the Stage 6 Water Shortage Level and its regulations will take effect immediately.

At any time during the Stage 6 water shortage condition period, the City Council may discontinue the Stage 6 or may implement another Stage Level describe in the City's WSCP. Once the City Council finds that a Stage 6 water shortage condition no longer exists, the Stage Level will no longer be in effect.

6 COMPLIANCE AND ENFORCEMENT

CWC 10632.

(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

The City will enforce the six standardized shortage response actions through the provisions established under the City's ordinances.

Under the City's Ordinance 1895, any customer violating the regulations and restrictions on water use set forth in the Ordinance will receive a written warning for the first such violation of Stage 1, Stage 2, Stage 3, Stage 4, or Stage 5 prohibitions. Upon a second violation within the preceding 12 consecutive months, the customer will receive a fine in an amount consistent with violation penalties set forth in Chapter 14.34 of the Glendora Municipal Code. For a third violation within the preceding 12 consecutive months, the customer will receive a fine in an amount consistent with violation penalties set forth in Chapter 14.34 of the Glendora Municipal Code. For a fourth (or more) violation within the preceding 12 consecutive months, the customer's violation will be punishable as a misdemeanor and the customer will receive a fine in an amount consistent with violation penalties set forth in Chapter 14.34 of the Glendora Municipal Code. Violations of Stage 1, Stage 2, Stage 3, Stage 4, or Stage 5 prohibitions may result in the City installing a flow-restrictor on the water service. If a flow-restrictor is placed, the customer will pay the cost of the installation and removal. If water service is disconnected, it will be restored only upon payment by the customer of the turn-on charge fixed by the City Council. A copy of City Ordinance 1895 is provided in Appendix A.

The City approved an Emergency Drought Response Plan (EDRP) on May 26, 2015. The EDRP describes the penalties for violating the Urgency Ordinance 1996, which established water use prohibitions during an emergency drought condition. As mentioned

in Section 4.2, the City considers an emergency drought condition as the Stage 6 water shortage level. The first violation will result in a written warning. The violation notice shall specify the nature of the violation(s), the date on which it occurred, the corrective measures to be performed, and notice that the violator shall: (A) Perform the corrective action; (B) Request a water use efficiency audit with the city within ten days; and,

(C) Undertake the relevant corrective action within ten days after completion of the water use efficiency audit. Upon the second violation, the customer will be subject to a fine in an amount consistent with violation penalties set forth in Chapter 14.34 of the Glendora Municipal Code. For a third violation or more within twelve months, the customer will be subject to a fine in an amount consistent with violation penalties set forth in Chapter 14.34 of the Glendora Municipal Code. Violations of the emergency water drought regulations may result in the City installing a flow restrictor on the service to the property.

7 LEGAL AUTHORITIES

CWC 10632.

(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

CWC Division 1, Section 350

The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

Under the City's Ordinance 1895 and Ordinance 1925, the City Council has the legal authority to call a public hearing to discuss the need to declare and implement a Stage 1, Stage 2, Stage 3, Stage 4, or Stage 5 water shortage. Upon finding that a water shortage condition exists, the City Council will adopt a Resolution declaring the appropriate water shortage response action to mitigate the existing drought condition.
Through the City's Urgency Ordinance 1996, the City Council has the authority to declare an emergency water shortage upon finding that one exists. Under this ordinance, the City Council may adopt a resolution that would place a Stage 6 water shortage response into effect without the need of hold a public hearing.

The City shall declare a water shortage emergency in accordance with CA Water Code CHAPTER 3 - Water Shortage Emergencies § 350 – 358.

Legal authorities include California Water Code Sections 71640-71644 Article 3. Water Shortages and CA Water Code § 366 (2025) CHAPTER 3.3 - Excessive Residential Water Use During Drought. The City will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.

8 FINANCIAL CONSEQUENCES OF WSCP

CWC 10632.

(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

To ensure compliance with CWC Chapter 3.3 (commencing with Section 365), additional costs may be incurred to monitor and enforce WSCP actions. These costs may vary depending on the applicable water shortage stage and the duration of the water shortage emergency.

Potential revenue reductions and expense increases associated with activated shortage response actions are regulated and tracked by the City's Finance Division.

The City's primary source of revenue is user service charges, which consists of bi-monthly fixed readiness-to-serve charges according to meter size and a volumetric charge per unit of water consumed. The bi-monthly fixed readiness-to-serve charges are sufficient to meet about 50 percent of the City's fixed expenses. The revenue from the consumption charge is designed to be sufficient to fund the remaining 50 percent of the fixed expenses plus all of the variable expenses associated with the cost of water. The current water rates are provided in Appendix F.

Consumption Rates include components for Tiered Rates and Elevation Rates. The City implements a four (4) consumption tier rate structure to promote water conservation. The Elevation Rate component is broken up by four (4) zone classes, which were established to assign the costs fairly and equitably.

The City anticipates potential impacts on expenditures associated with operations. An increase in staff cost may be triggered by salaries and benefits for new hires required to administer and implement the WSCP. Necessary alternative sources of water supply may also increase operations and maintenance costs. Additionally, a new water supply source would increase the cost of supply and treatment.

The City has historically maintained a financial reserve in its Water Fund. The City may use financial reserves for water system expenditures to make up for shortfalls in water revenue associated with unanticipated reduced water sales for a transient period.

In 2023, the City approved a water rate structure with certain automatic adjustments relating to third-party costs incurred in the operation of the City's water system and the normal cost of living or Consumer Price Index (CPI) inflation adjustment, not to exceed 5 percent. These automatic adjustments are necessary to keep the water operations solvent and financially sound. They allow for the recovery of actual costs for energy purchased from Southern California Edison and the City of Azusa Power, along with any water purchased from MWD through TVMWD. The approved rate structure allows adjustments, if necessary, based on actual costs incurred. The City will provide notification to customers in advance of any rate change before implementation.

9 MONITORING AND REPORTING

CWC 10632.

(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

Customer compliance of the provisions adopted by declaration of a WSCP is monitored through the City's water waste enforcement program and advanced metering infrastructure (AMI). Staff track violations, investigations, violation notices, and penalties for non-compliance with the WSCP, and it is reported through the monthly Urban Water Supplier Reports. In addition, the City offers a Smart Water Meter Program utilizing AMI technology that allows customers to self-monitor their water use in real time with customer notifications on leaks and high usage.

10 WSCP REFINEMENT PROCEDURES

CWC 10632.

(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure

shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

The City's WSCP has been prepared as an adaptive management plan. As discussed in Section 9, the City will monitor and report on the implementation of the WSCP. The City will review the implementation results for any current or potential shortage gaps between water supplies and demands. The City will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. The City will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 8 of the UWMP).
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 4.1).
- Implementation of stricter enforcement actions and penalties (discussed in Section 6).
- Improvements to the water supply augmentation responses (discussed in Section 4.2), as well as any associated operational changes (discussed in Section 4.3) which may be required.
- Incorporation of additional actions recommended by City staff or other interested parties.

The City will use the monitoring and reporting data to evaluate the ability of these potential revisions to resolve any shortage gaps that may occur within the standard water shortage levels.

This WSCP is adopted as part of the City's 2025 UWMP adoption process discussed in Section 9.2 of the UWMP. It is anticipated that the City will review, revise, and adopt an updated WSCP as part of the 2030 UWMP, as necessary. However, the City will continue

to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to the City's WSCP will include a public hearing and adoption process by the City Council (see Section 12).

11 SPECIAL WATER FEATURE DISTINCTION

CWC 10632.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

The City's WSCP defines "decorative water features" as water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water features. As a result, the City's WSCP has reviewed the response actions, enforcement actions, and monitoring and reporting programs separately for decorative water features and for pools and spas, as applicable.

12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

CWC 10632.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

CWC 10635.

(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

The City's WSCP is adopted as part of the City's 2025 UWMP adoption process discussed in Chapter 9 of the UWMP. The process for adopting the City's WSCP includes the following:

- The City will conduct a public hearing and make the WSCP available for public inspection.
- The City will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- The City will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- The City Council will adopt the 2025 UWMP and the WSCP.
- As part of submitting the 2025 UWMP to DWR, the City will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2026. The City will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, the City will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

- The City will conduct a public hearing and make the amended WSCP available for public inspection.
- The City Council will adopt the amended WSCP.
- The City will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.
- Per 10635(c), Within 30 days after submission of the WSCP to DWR, the City will provide the WSCP to any city or county within which they provide water.

Additional information regarding the adoption, submittal, and availability of the City's WSCP (and 2025 UWMP) is provided in Chapter 9 of the UWMP.

APPENDIX A

ORDINANCE 1895

ORDINANCE NO. 1895

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF GLENDORA ADDING CHAPTER 14.34 ENTITLED WATER CONSERVATION

THE CITY COUNCIL
City of Glendora, California

WHEREAS, the City of Glendora is a general law City;

WHEREAS, the City Council of the City of Glendora is desirous of establishing water conservation standards to ensure that the City is are able to serve the basic health and safety needs for all water customers serviced by the City of Glendora.

NOW, THEREFORE THE CITY COUNCIL OF THE CITY OF GLENDORA **DOES ORDAIN AS FOLLOWS:**

SECTION 1. A new Chapter 14.34 of the Glendora Municipal Code is hereby added to read as follows:

"14.34.010 Definitions

"Consumer" means a person or entity who uses water provided by the City of Glendora.

"Account Holder" means the person or entity responsible for payment of water services provided by the City of Glendora at a particular property, as shown in the City's water billing records.

"Independent Hearing Officer" means a neutral person designated by the city manager. The Independent Hearing Officer may be selected from programs such as the Los Angeles County Bar Association, JAMS or other similar programs offering the services of qualified independent hearing officers to hear such matters.

"Director" means the Director of the Department of Public Works or a designated representative.

"Drought condition" means a condition in which the existing or projected water supply available to the City is not anticipated to meet the ordinary water requirements of Consumers. This condition may be the result of factors including but not limited to voluntary or mandatory curtailment of the City's water allocation the Upper San Gabriel Valley Watermaster, from the Metropolitan Water District, emergency conditions, and/or failure of the City's or its supplier's water distribution systems.

"Independent Hearing Officer" means a neutral person designated by the city manager. The Independent Hearing Officer may be selected from programs such as the Los Angeles County Bar Association, JAMS or other similar programs offering the services of qualified independent hearing officers to hear such matters.

"Flow Restrictor" means a device for reducing the flow of water through a meter.

"Third party purveyor" means water purveyors to which the City provides water, including but not limited to Suburban Water, Covina Irrigating Company and the City of Azusa.

"Waste" means, including but not limited to, any use of water which causes unnecessary water runoff beyond the boundaries of any property as a result of overwatering the landscaping or vegetation, a broken irrigation system, improper spray direction of sprinkler nozzles, or failure to implement best practices irrigation planning. Waste also includes any failure to repair as soon as reasonably possible any leak or rupture in any water pipes, faucets, valves, plumbing fixtures or other water service appliances. Waste shall also mean the use of running water through an exterior hose, pipe or faucet not equipped with an automatic shut-off nozzle.

14.34.020. Application

The provisions of this chapter shall apply to all customers and property served water by the City's Water Division wherever situated, and shall also apply to all property and facilities owned, maintained, operated, or under the jurisdiction of the various officers, departments, commissions, and agencies of the City.

14.34.030. Prohibition Against Waste of Water

It shall be a violation of the Glendora Municipal Code for any Consumer or Account Holder to waste any water obtained from or through the water facilities of the City.

14.34.040. Access to Water Meters

The City shall be given access to a Consumer's water meter for meter reading and repairing, shutting off or turning on water service and installation or removal of flow restrictors, wherever the meter is located. Such access shall not inhibit the operations of the City's Water Division.

14.34.050. Place of Use of Water

Except as otherwise provided in this Ordinance or as specifically authorized by the Director, water received from or through a Consumer's water meter shall be used only on and for the property served by that meter.

14.34.060. Voluntary Water Conservation Drought Condition

A. Upon adoption by the City Council of a Resolution declaring a Voluntary Conservation Drought Condition and for as long as the City is needing or projecting to import at least 25% of its water needs during any 12 month period, all water Consumers will be encouraged to voluntarily reduce water consumption to a level by at least 10%. This shall apply to all public and private properties and facilities.

B. The City shall implement the following programs if a Voluntary Conservation Drought Condition has been declared:

1. Educational outreach:

a. Public mailings to residents on at least a bi-monthly basis requesting voluntary conservation and offering conservation measures suggestions.

b. Purchase conservation materials that can be used to educate customers directly or indirectly through community based organization events.

c. Inform restaurants and motel/hotel establishments of the need to reduce water offerings. Supply materials and signs to assist with the implementation of voluntary conservation measures.

2. Conservation Capital Program:

a. Offer a conservation capital program to customers based on similar economic formulas adopted by the California Public Utilities Commission.

b. Offer a conservation capital program based on any program adopted by the California Public Utilities Commission for other water purveyors.

3. The Director or his designee is authorized to turn off the water of any property that fails to make corrective changes to any broken water system, sprinkler, etc., within 72 hours of being notified by the City by posting in a conspicuous location on the property.

14.34.070 Stage One Drought Condition

A. A Stage One Drought Condition may be implemented by the City Council when one or more of the following conditions exists:

1. Imported water is needed to meet 40% of the City's water system demand for the current or next fiscal year.

2. The City's water well production for the current fiscal year is reduced by 25% below the production level for the same period of the preceding year.

3. Upon recommendation by the Water Commission that a water shortage exists, such as when the projected supply and demand for water reduces storage capacities and/or a reduction in the City's ability to purchase water.

B. Prior to implementation of a stage one drought condition plan as provided in this chapter, the City Council shall hold a public hearing for the purposes of determining whether a the need for implementing a stage one drought condition exists. Notice of the time and place of said public hearing shall be published not less than 10 days before the hearing in a newspaper of general circulation within the City. The City Council may, upon finding that the need for implementing a stage one drought condition exists, order implementation of a stage one drought condition plan as provided in this chapter. Said order shall be made by Resolution of the City Council and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such publication. The provisions of this Section shall

take effect with the first full billing period commencing on or after the effective date of the City Council's Resolution. At any time during the stage one drought condition period, the City Council may discontinue any plan or may implement another plan as provided in this chapter. Upon a finding by the City Council that a stage one drought condition no longer exists, the stage one drought condition then in effect shall terminate.

C. Upon adoption by the City Council of a Resolution declaring a Stage One Drought Condition and for as long as that condition exists, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

1. Each of the Voluntary Conservation Drought Condition regulations shall be applicable as long as they are not in conflict with the more restrictive regulations of the Stage One Drought Condition.

2. The use of continuous running water from a hose, pipe, or faucet for the purpose of cleaning buildings and paved, tile, wood, plastic or other surfaces shall be prohibited, except in the event the Director determines that such use is the only feasible means of correcting a potential threat to health, sanitation or safety.

3. Every operator of a restaurant providing table service shall offer water only upon request and post table signs notifying its customers of drought conditions and that water is available upon request.

4. Every operator of a hotel, motel, or other commercial establishment offering lodgings shall institute daily washing of towels and linens only upon request and shall post signs in each room notifying customers of the drought condition.

5. Any use of water that causes runoff to occur beyond the immediate vicinity of use shall be prohibited.

6. Watering shall be prohibited from 6:00 a.m. to 8:00 p.m. of any yard, orchard, park, golf course, recreational area, or other area containing vegetation with the following exceptions:

a. The irrigation of trees and shrubs shall be allowed by any means and at any time of the day provided that:

(1) The irrigation shall be confined to the area within the drip line of a tree or shrub.
(2) There shall be no run-off as a result of the irrigation
(3) That the irrigation shall not exceed 5 minutes to each tree or shrub during any 24-hour period.

b. The irrigation of plant material within commercial nurseries shall be allowed at any time of the day provided that:

(1) The water is applied only to one plant or container of plants at a time; and
(2) The water is applied by means of a hose equipped with an automatic shut-off nozzle.

c. The irrigation of golf course greens and City parks shall be allowed by any means and at any time of the day for the purpose of germinating seed, promoting growth of sod, or leaching minerals from the soil for new growth purposes only.

7. When a Stage One Drought Condition is declared, all Consumers shall reduce their water consumption by at least 10% below their average consumption for the same period of the previous year, or the year prior to the Stage One Drought Condition being declared.

D. The Director or his/her designee is authorized to turn off the water of any property that fails to make corrective changes to any broken water system, sprinkler, etc., within 24 hours of being notified by the City by posting in a conspicuous location on the property.

14.34.070 Stage Two Drought Condition

A. A Stage Two Drought Condition may be implemented by the City Council when any of the following conditions exist:

1. City well production losses and Metropolitan Water District purchased water restrictions threaten the City's ability to meet system demand.

2. Imported water is needed to meet 60% of the system demand.

3. Upon recommendation by the Water Commission that a water shortage exists when the projected supply and demand for water reduces storage capacities and/or the ability to purchase water.

B. Prior to implementation of a Stage Two Drought Condition as provided in this chapter, the City Council shall hold a public hearing for the purposes of determining whether a need to implement a Stage Two Drought Condition exists. Notice of the time and place of said public hearing shall be published not less than 10 days before the hearing in a newspaper of general circulation within the City. The City Council may, upon finding that a need to implement a Stage Two Drought Condition exists, order implementation of a Stage Two Drought Condition as provided in this chapter, or other measures which it deems appropriate to address the water shortage. Said order shall be made by Resolution and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such publication. The provisions of this Section shall take effect with the first full billing period commencing on or after the effective date of the City Council's Resolution. At any time during the Stage Two Drought Condition period, the City Council may discontinue the Stage Two Drought Condition or may implement another plan as provided in this chapter. Upon a finding by the City Council that a Stage Two Drought Condition no longer exists, the Stage Two Drought Condition then in effect shall terminate.

C. Upon adoption by the City Council of a Resolution declaring a Stage Two Drought Condition and for as long as that condition exists, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City.

1. Each of the Stage One Drought Condition regulations shall be applicable as long as they are not in conflict with any more restrictive regulations of the Stage Two Drought Condition.

2. With the exception of Subsection 3 below, the use of water through a meter that is used solely for irrigation purposes shall be prohibited, and the City shall have the right to shut off water service to any such meter without notice to the Customer, Account Holders or any other person.

3. The watering of any yard, orchard, hillside, park, golf course, recreational area, or other area containing vegetation shall be limited to Monday, Wednesday and Friday for all even address locations shall be limited to Tuesday, Thursday and Saturday for all odd address locations. Such watering times shall be limited to no more than 5 minutes for each water cycle station and done only between the hours of 8:00 p.m. and 6:00 a.m.

4. The private washing of all recreational vehicles and other vehicles shall be prohibited, except by use of a bucket and hose equipped with a self-closing valve that requires operator pressure to activate the flow of water.

5. The Director is authorized to discontinue the supply of water to third party water purveyors during a Stage Two Drought Condition.

6. When a Stage Two Drought Condition is declared, all Consumers shall reduce their water consumption by at least 15% below their average consumption for the same period of the previous year, or the year prior to the Stage Two Drought Condition being declared.

14.34.080 Exemptions

A. Exemptions to the water use regulations set forth in this chapter may be granted by the Director for specific uses of water on the basis of hardship, or if necessary to protect the public health, sanitation or safety and in accordance with such guidelines for exemptions as the City Council may adopt, upon written application of the affected Account Holder.

B. In determining whether to grant exemptions to the water regulations, the Director shall take into consideration all factors relevant to the customer's water usage, including, but not limited to:

1. Whether any additional reduction in the customer's water consumption will result in unemployment;

2. Whether additional members have been added to the customer's household;

3. Whether any additional landscaped property has been added to the customer's property subsequent to the base period;

4. Changes in vacancy factors in multi-family housing;

5. Increased number of employees in commercial, industrial and governmental offices;

6. Increased production requiring increased process water;

7. Water uses during new construction;

8. Adjustments to water use caused by emergency, health or safety hazards;

9. First filling of a permit-constructed swimming pool;

10. Water use necessary for reasons related to family illness or health; and

11. Whether the customer had, prior to the implementation of the applicable Drought Condition Plan, taken measures to reduce the Customer's water consumption to the greatest extent possible.

C. Relief shall be granted only on a showing by the Customer that the Customer has achieved the maximum practical reduction in water consumption in the Customer's residential, commercial, industrial, agricultural or governmental water consumption, as the case may be, other than in the specific areas in which relief is being sought. No relief shall be granted to any Customer who, when requested by the Department, fails to provide the Department with relevant information

D. A denial of a request for an exemption shall be made within five (5) calendar days after the application was received. The denial may be appealed to the Water Commission by filing a written request with the City Clerk within ten (10) calendar days after written notice of the Director's decision was deposited in the U.S. mail addressed to the Account Holder at the address shown on the application. The decision of the Water Commission shall be rendered within forty five (45) calendar days after the request was received by the City Clerk. The decision of the Water Commission shall be final.

E. The prohibited uses of water from the Water Division provided in this chapter are not applicable to that use of water necessary for public health and safety or for essential governmental services such as police, fire, and emergency services. Nothing contained in this chapter shall be construed to require the division to curtail the supply of water to any customer when, in the discretion of the division, such water is required by that customer to maintain an adequate level of public health and safety.

13.34.090 Violations

A. Any failure to comply with any provision of this chapter shall be punishable as an infraction or misdemeanor as set forth herein. Every person who violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which the violation is committed, continued or permitted by such person.

B. The Director or his/her designee is authorized to turnoff the water to any property that fails to make emergency repairs to any broken water system or sprinkler.

C. Violations of the regulations of the Stage One or Stage Two Drought Conditions shall be punishable as follows:

1. The Director or his designee shall give first-time violators a courtesy notice of the violation. The first citation shall specify the nature of the violations, the date on which it occurred and the corrective measures to be taken. No prosecution or punishment shall be initiated or levied in connection with the first violation.

2. Upon a second violation within the preceding twelve (12) consecutive calendar months, the water Account Holder shall be punishable as an infraction. The Director shall issue a written notice of violation to the Account Holder for the property where the violation occurred or is occurring, and impose a fine in the amount of $150.00.

3. Upon a third violation within the preceding twelve (12) consecutive calendar months, the water Account Holder shall be punishable as an infraction. The Director shall issue a written notice of violation to the Account Holder for the property where the violation occurred or is occurring, and impose a fine in the amount of $250.00.

4. Upon a fourth, or more violations within the preceding twelve (12) consecutive calendar months, the water Account Holder shall be punishable as a misdemeanor with a fine to be imposed in the amount of $1,000.00.

D. Violations of the regulations of the Stage One or Stage Two Drought Conditions may result in the city installing a flow restrictor on the service to the property where the violation occurred or is occurring, for a period to be determined by the Director.

E. Any penalty imposed pursuant to this chapter shall be added to the account of the Account Holder for the property where the violation occurred or is occurring and shall be due and payable on the same terms and subject to the same conditions as any other charge for regular water service. The maximum amount of penalties which an Account Holder may be required to pay during any twelve consecutive calendar month period are hereby established by this Ordinance of the City of Glendora. Penalties must be paid in full prior to restoration of water service.

F. Nothing in this Ordinance shall limit or be construed to limit the right of an Account Holder to seek reimbursement of a penalty from a tenant or other consumer.

14.34.100. Notice of Violation and Request for Hearing

A. For each violation of this Ordinance, the Director shall give notice as follows:

1. By sending written notice through the U.S. mail to the Account Holder for the property where the violation occurred or is occurring, at the current billing address shown in the City's water billing records; and

2. By affixing written notice in a conspicuous place on the property where the violation occurred or is occurring.

B. Any written notice given under this section shall contain a statement of:

1. The date of the notice;

2. The time, place and nature of the violation;

3. The person (s) committing the violation, if known;

4. The provision (s) of this Ordinance violated;

5. The possible penalties for each violation;

6. The Account Holder's right to request a hearing on the violation and the time within which such a request must be made; and

7. The Account Holder's loss of the right to a hearing in the event the account holder fails to request a hearing within the time required.

C. Any Account Holder receiving a notice of an administrative citation may contest that there was a violation of the code or that he or she is the responsible party by submitting a Request for Hearing form and returning it to the city within ten (10) calendar days of the date of the notice of violation. The Account Holder must also post with the Director a check/money order/cahier's check in the amount of the proposed penalty for the violation(s) at the same time the request for a hearing is made.

D. Within thirty (30) calendar days after the Request for Hearing form is received, an Independent Hearing Officer shall conduct the hearing, at which both written and oral evidence may be presented, and shall decide whether a violation occurred and the appropriate penalty. In determining the appropriate penalty, the Independent Hearing Officer may consider all mitigating factors associated with the violation. The Director shall give written notice of the decision in accordance with Subsection A.1 of this Section.

E. For all appeals under this chapter the decision of the Independent Hearing Officer shall be final.

F. There shall be no surcharge added to the account of the Account Holder and no installation of a flow restrictor until the notice of violation has become final or there is a final decision of the Independent Hearing Officer ordering the penalty and installation of a flow restrictor or shut off of water service.

14.34.110. Water Conservation Standards

A. Plumbing Standards For Water Conservation. Plumbing standards for water conservation shall be as contained in the California Plumbing Code as adopted and amended by the City of Glendora in Chapter 19.08 of the Glendora Municipal Code.

B. Water Conservation Landscape Design Standards. All development proposals that are subject to review by the Department of Planning and Redevelopment, Project Review Committee or Planning Commission shall be required to install drought resistant landscaping in compliance Section 21.03.060 of the Glendora Municipal Code. Each development proposal not subject to

such review shall comply with such other water conservation landscape requirements as may be adopted by the Department of Planning and Redevelopment.

SECTION 2. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held to be invalid or unenforceable by a court of competent jurisdiction, the remaining portions of this Ordinance shall nonetheless remain in full force and effect. The people of the City of Glendora hereby declare that they would have adopted each section, subsection, sentence, clause, phrase, or portion of this Ordinance, irrespective of the fact that any one or more sections, subsections, sentences, clauses, phrases, or portions of this Ordinance by declared invalid or unenforceable.

SECTION 3. The Mayor shall sign this ordinance and the City Clerk shall attest and certify to the passage and adoption thereof and cause same to be published at least once in the Glendora Press, a weekly newspaper of general circulation, published in the City of Glendora, which newspaper is hereby designated for that purpose; and thereupon, and thirty (30) days after its passage, this ordinance shall take effect and be in force.

PASSED, APPROVED and **ADOPTED** this 27th day of May, 2008.

City Council of Glendora, California

By: _____
KAREN K. DAVIS, Mayor

ATTEST:

_____
KATHLEEN R. SESSMAN, City Clerk

APPROVED AS TO FORM:

_____
D. WAYNE LEECH, City Attorney

State of California
County of Los Angeles } ss.
City of Glendora

I, Kathleen R. Sessman, City Clerk of the City of Glendora, do hereby certify that the foregoing Ordinance was introduced for first reading on May 13, 2008. Thereafter, said Ordinance was duly approved and adopted at a regular meeting of the City Council on May 27, 2008, by the following roll call vote:

AYES: Council Members: Clifford, Herman, Tessitor, Kelly, Davis
NOES: Council Members: None
ABSENT: Council Members: None
ABSTAIN: Council Members: None

Dated: May 29, 2008

KATHLEEN R. SESSMAN, City Clerk

APPENDIX B

ORDINANCE 1925

ORDINANCE NO. 1925

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF GLENDORA, CALIFORNIA AMENDING SECTION 14.34.070 OF THE MUNICIPAL CODE WITH RESPECT TO MANDATORY CONSERVATION MEASURES

THE CITY COUNCIL
CITY OF GLENDORA, CALIFORNIA

WHEREAS, the City of Glendora is a general law City;

WHEREAS, the City Council of the City of Glendora is desirous of establishing water conservation standards to ensure that the City is able to serve the basic health and safety needs for all water customers serviced by the City of Glendora

NOW, THEREFORE THE CITY COUNCIL OF THE CITY OF GLENDORA DOES ORDAIN AS FOLLOWS:

SECTION 1. Section 14.34.070 of the Glendora Municipal Code is hereby amended to read as follows:

14.34.070 Stage One Drought Condition

A. A Stage One Drought Condition may be implemented by the City Council when one or more of the following conditions exists:

1. Imported water is needed to meet 40% of the City's water system demand for the current or next fiscal year.

2. The City's water well production for the current fiscal year is reduced by 25% below the production level for the same period of the preceding year.

3. Upon recommendation by the Water Commission that a water shortage exists, such as when the projected supply and demand for water reduces storage capacities and/or a reduction in the City's ability to purchase water.

B. Prior to implementation of a stage one drought condition plan as provided in this chapter, the City Council shall hold a public hearing for the purposes of determining whether a the need for implementing a stage one drought condition exists. Notice of the time and place of said public hearing shall be published not less than 10 days before the hearing in a newspaper of general circulation within the City. The City Council may, upon finding that the need for implementing a stage one drought condition exists, order implementation of a stage one drought condition plan as provided in this chapter. Said order shall be made by Resolution of the City Council and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such publication. The provisions of this Section shall take effect with the first full billing period commencing on or after the effective date of the City Council's Resolution. At any time during the stage one drought condition period, the City Council may discontinue any plan or may implement another plan as provided in this chapter.

Upon a finding by the City Council that a stage one drought condition no longer exists, the stage one drought condition then in effect shall terminate.

C. Upon adoption by the City Council of a Resolution declaring a Stage One Drought Condition and for as long as that condition exists, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

1. Each of the Voluntary Conservation Drought Condition regulations shall be applicable as long as they are not in conflict with the more restrictive regulations of the Stage One Drought Condition.

2. The use of continuous running water from a hose, pipe, or faucet for the purpose of cleaning buildings and paved, tile, wood, plastic or other surfaces shall be prohibited, except in the event the Director determines that such use is the only feasible means of correcting a potential threat to health, sanitation or safety.

3. Every operator of a restaurant providing table service shall offer water only upon request and post table signs notifying its customers of drought conditions and that water is available upon request.

4. Every operator of a hotel, motel, or other commercial establishment offering lodgings shall institute daily washing of towels and linens only upon request and shall post signs in each room notifying customers of the drought condition.

5. Any use of water that causes runoff to occur beyond the immediate vicinity of use shall be prohibited.

6. Watering shall be prohibited from 8:00 a.m. to 5:00 p.m. of any yard, orchard, park, golf course, recreational area, or other area containing vegetation with the following exceptions:

a. The irrigation of trees and shrubs shall be allowed by any means and at any time of the day provided that:

(1) The irrigation shall be confined to the area within the drip line of a tree or shrub.

(2) There shall be no run-off as a result of the irrigation

(3) That the irrigation shall not exceed 5 minutes to each tree or shrub during any 24-hour period.

b. The irrigation of plant material within commercial nurseries shall be allowed at any time of the day provided that:

(1) The water is applied only to one plant or container of plants at a time; and

(2) The water is applied by means of a hose equipped with an automatic shut-off nozzle.

c. The irrigation of golf course greens and City parks shall be allowed by any means and at any time of the day for the purpose of germinating seed, promoting growth of sod, or leaching minerals from the soil for new growth purposes only.

7. When a Stage One Drought Condition is declared, all Consumers shall reduce their water consumption by at least 10% below their average consumption for the same period of the previous year, or the year prior to the Stage One Drought Condition being declared.

D. The Director or his/her designee is authorized to turn off the water of any property that fails to make corrective changes to any broken water system, sprinkler, etc., within 24 hours of being notified by the City by posting in a conspicuous location on the property.

14.34.070 Stage Two Drought Condition

A. A Stage Two Drought Condition may be implemented by the City Council when any of the following conditions exist:

1. City well production losses and Metropolitan Water District purchased water restrictions threaten the City's ability to meet system demand.

2. Imported water is needed to meet 60% of the system demand.

3. Upon recommendation by the Water Commission that a water shortage exists when the projected supply and demand for water reduces storage capacities and/or the ability to purchase water.

B. Prior to implementation of a Stage Two Drought Condition as provided in this chapter, the City Council shall hold a public hearing for the purposes of determining whether a need to implement a Stage Two Drought Condition exists. Notice of the time and place of said public hearing shall be published not less than 10 days before the hearing in a newspaper of general circulation within the City. The City Council may, upon finding that a need to implement a Stage Two Drought Condition exists, order implementation of a Stage Two Drought Condition as provided in this chapter, or other measures which it deems appropriate to address the water shortage. Said order shall be made by Resolution and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such publication. The provisions of this Section shall take effect with the first full billing period commencing on or after the effective date of the City Council's Resolution. At any time during the Stage Two Drought Condition period, the City Council may discontinue the Stage Two Drought Condition or may implement another plan as provided in this chapter. Upon a finding by the City Council that a Stage Two Drought Condition no longer exists, the Stage Two Drought Condition then in effect shall terminate.

C. Upon adoption by the City Council of a Resolution declaring a Stage Two Drought Condition and for as long as that condition exists, the following water use regulations, and such other regulations as may be adopted by Resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City.

1. Each of the Stage One Drought Condition regulations shall be applicable as long as they are not in conflict with any more restrictive regulations of the Stage Two Drought Condition.

2. With the exception of Subsection 3 below, the use of water through a meter that is used solely for irrigation purposes shall be prohibited, and the City shall have the right to shut off water service to any such meter without notice to the Customer, Account Holders or any other person.

3. The watering of any yard, orchard, hillside, park, golf course, recreational area, or other area containing vegetation shall be limited to Monday, Wednesday and Friday for all even address locations shall be limited to Tuesday, Thursday and Saturday for all odd address locations. Such watering times shall be limited to no more than 5 minutes for each water cycle station and done only between the hours of 5:00 p.m. and 8:00 a.m.

4. The private washing of all recreational vehicles and other vehicles shall be prohibited, except by use of a bucket and hose equipped with a self-closing valve that requires operator pressure to activate the flow of water.

5. The Director is authorized to discontinue the supply of water to third party water purveyors during a Stage Two Drought Condition.

6. When a Stage Two Drought Condition is declared, all Consumers shall reduce their water consumption by at least 15% below their average consumption for the same period of the previous year, or the year prior to the Stage Two Drought Condition being declared.

SECTION 2. If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held to be invalid or unenforceable by a court of competent jurisdiction, the remaining portions of this Ordinance shall nonetheless remain in full force and effect. The people of the City of Glendora hereby declare that they would have adopted each section, subsection, sentence, clause, phrase, or portion of this Ordinance, irrespective of the fact that any one or more sections, subsections, sentences, clauses, phrases, or portions of this Ordinance by declared invalid or unenforceable.

SECTION 3. The Mayor shall sign this ordinance and the City Clerk shall attest and certify to the passage and adoption thereof and cause same to be published at least once in the Glendora Press, a weekly newspaper of general circulation, published in the City of Glendora, which newspaper is hereby designated for that purpose; and thereupon, and thirty (30) days after its passage, this ordinance shall take effect and be in force.

PASSED, APPROVED and **ADOPTED** this 25th day of August, 2009.

City Council of Glendora, California

BY: Karen K. Davis

KAREN K. DAVIS, Mayor

APPROVED AS TO FORM:

WAYNE LEECH, City Attorney

I, Kathleen R. Sessman, City Clerk of the City of Glendora, California, DO HEREBY CERTIFY that the foregoing Ordinance was introduced for first reading on August 11, 2009 by the following roll call vote:

AYES:	COUNCIL MEMBERS:	Clifford, Murabito, Herman and Davis.
NOES:	COUNCIL MEMBERS:	None.
ABSENT:	COUNCIL MEMBERS:	Tessitor.
ABSTAIN:	COUNCIL MEMBERS:	None.

Thereafter, said Ordinance was duly approved and adopted at a Regular Meeting of the City Council on August 25, 2009, by the following roll call vote:

AYES:	COUNCIL MEMBERS:	Clifford, Murabito, Tessitor Herman and Davis.
NOES:	COUNCIL MEMBERS:	None.
ABSENT:	COUNCIL MEMBERS:	None.
ABSTAIN:	COUNCIL MEMBERS:	None.

I further certify that said Ordinance was published as required by law in a newspaper of general circulation in the City of Glendora, California on the 3rd day of September, 2009.

Dated: August 26, 2009

KATHLEEN R. SESSMAN, City Clerk

APPENDIX C

URGENCY ORDINANCE 1996

ORDINANCE 1996

AN URGENCY ORDINANCE OF THE CITY COUNCIL OF THE CITY OF GLENDORA, CALIFORNIA, ENACTING MANDATORY EMERGENCY WATER CONSERVATION REGULATIONS TO COMPLY WITH GOVERNOR BROWN'S EXECUTIVE ORDER B-29-15 AND THE REGULATIONS PROMULGATED BY THE STATE WATER RESOURCES CONTROL BOARD IN RESPONSE THERETO

THE CITY COUNCIL
City of Glendora, California

THE CITY COUNCIL OF THE CITY OF GLENDORA DOES HEREBY ORDAIN AS FOLLOWS:

WHEREAS, pursuant to Section 36937 of the California Government Code, a City Council may adopt as an urgency measure an ordinance to protect the public safety, health, or welfare; and

WHEREAS, on April 1, 2015, Governor Brown issued Executive Order B-29-15, imposing restrictions on water use in order to achieve an aggregate statewide 25 percent reduction in potable urban water usage through February 2016; and

WHEREAS, on May 5, 2015, in accordance with the Governor's Executive Order B-29-15, the State Water Resources Control Board adopted Resolution 2015-0032 detailing emergency regulations ("Regulations") implementing a statewide 25% reduction in potable urban water use; and

WHEREAS, the Regulations establish conservation levels for water suppliers based on an average Residential Gallons per Capita per Day ("R-GPCD") for the period of July through September 2014, and the City of Glendora has been categorized among the cities mandated with a 36 percent potable urban water use reduction; and

WHEREAS, the City Council of the City of Glendora wishes to implement comprehensive regulations in order to comply with Executive Order B-29-15, to protect the public health, safety, and welfare; and

WHEREAS, the long-term health, safety, and prosperity of the community depends upon having a reliable supply of potable water.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENDORA, CALIFORNIA, DOES RESOLVE, DECLARE, DETERMINE AND ORDER AS FOLLOWS:

SECTION 1. A new Section 14.34.120 of the Glendora Municipal Code is hereby added to read as follows:

"14.34.120 Emergency water conservation drought condition

(a) An emergency water drought condition may be ordered by the City Council in order to comply with the Governor's Executive Order B-29-15, which is implemented by the State Water Resources Control Board's adoption of Resolution 2015-0032 detailing emergency regulations for a statewide 25% reduction in potable urban water use, and other emergency water drought orders and regulations ordered by the Governor or other State boards or agencies.

(b) Prior to implementation of an emergency water drought condition as provided in this chapter, the City Council may, upon finding that a need to order an emergency water drought condition exists, order an emergency water drought condition, or other measures which it deems appropriate to address the water shortage emergency. Said order shall be made by resolution and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such adoption. The provisions of this section shall take effect immediately upon the effective date of the City Council's resolution.

(c) Upon order of an emergency water drought condition and for as long as that condition exists, the following water use regulations, and such other regulations as may be adopted by resolution of the City Council, shall apply to all use of water that is provided by or through the water distribution facilities of the City:

(1) Each of the stage one drought condition regulations shall be applicable as long as they are not in conflict with more restrictive regulations of the emergency water conservation regulations.

(2) All residential users, inclusive of single family, and multi-family 2-4 units shall reduce their water consumption to the R-GPCD consumption levels set forth in a formal resolution adopted by the city council, which will comply with the State of California mandated consumption reduction level regulations.

(3) All non-residential users with landscape areas greater than 500 square feet shall reduce their water consumption by 25% compared to the same billing months from the year 2013.

(4) All non-residential users with no or landscape areas of 500 square feet or less shall reduce their water consumption by 10% compared to the same billing months from the year 2013.

(5) All outdoor ornamental turf watering shall be limited to no more than two days a week and not more than 10 minutes at each water station per day.

(6) To prevent the waste and unreasonable use of water and to promote water conservation, each of the following actions is prohibited, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency:

(a) The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;

(b) The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;

(c) The application of potable water to driveways and sidewalks;

(d) The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system;

(e) The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall;

(f) The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

(g) The irrigation with potable water of ornamental turf on public street medians; and

(h) The irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

(7) All operators of hotels, motels, or other commercial establishments offering lodgings shall provide guests with the option of choosing not to have towels and linens laundered daily. The operators of these facilities shall prominently display notice of this option in each guestroom using clear and easily understood language and ensure such notices are maintained;

(d) The City Manager or his designee is hereby authorized to implement all necessary measures or actions mandated or required to meet water conservation mandates imposed by the California State Water Resources Control Board or other State agencies without any further action by the City Council. All such actions shall be reported to the city council for adoption by resolution prior to implementation.

(e) Violation of the emergency water drought condition regulations shall be punishable as an infraction or misdemeanor as set forth herein. Every person who violates any provision of this chapter shall be guilty of a separate offense for each and every day during any portion of which the violation is committed, continued or permitted by such person. Violations shall be punishable as follows:

(1) The director or his or her designee shall give first-time violators a courtesy notice of the violation. The courtesy notice shall specify the nature of the violation(s), the date on which it occurred, the corrective measures to be performed, and notice that the violator shall:

(a) Perform the corrective action;

(b) Request a water use efficiency audit with the City within 10 days; and

(c) Undertake the relevant corrective action within 10 days after completion of the water use efficiency audit.

(2) Upon a second violation the violation by the water account holder shall be punishable as an infraction. The director or his or her designee shall issue a written notice of violation to the account holder for the property where the violation occurred or is occurring, and impose a fine in the amount of two hundred fifty dollars.

(a) Failure to comply with the corrective actions identified in the remedial water use efficiency audit in the first violation shall be deemed second violation subject to a two hundred fifty dollar fine.

(b) Failure to comply with the corrective actions identified in the remedial water use efficiency audit in the first violation shall be deemed a separate violation every three days thereafter until the corrective action is completed.

(3) Upon a third violation the violation by the water account holder shall be punishable as an infraction. The director shall issue a written notice of violation to the account holder for the property where the violation occurred or is occurring, and impose a fine in the amount of one thousand dollars.

(4) Violations of the emergency water drought condition regulations may result in the City installing a flow restrictor on the service to the property where the violation occurred or is occurring, for a period to be determined by the director.

(5) Any penalty imposed pursuant to this chapter shall be added to the account of the account holder for the property where the violation occurred or is occurring and shall be due and payable on the same terms and subject to the same conditions as any other charge for regular water service. The maximum amount of penalties which an account holder may be required to pay during any twelve consecutive calendar month period are hereby established by this chapter of the Glendora Municipal Code. Penalties must be paid in full prior to restoration of water service.

(6) Nothing in this chapter shall limit or be construed to limit the right of an account holder to seek reimbursement of a penalty from a tenant or other consumer."

SECTION 2. Section 21.03.060 of the Glendora Municipal Code is hereby deleted and repealed in its entirety.

SECTION 3. A new section 21.03.060 of the Glendora Municipal Code is hereby added to read as follows:

"21.03.060 State model water efficient landscaping ordinance adopted by reference.

(a) The City adopts by reference the California State Model Water Efficient Landscaping Ordinance (AB 1881), and any amendments thereto, as the law of the City. One copy of the California State Model Water Efficient Landscaping Ordinance has been, and is now, filed in the office of the planning director, and the ordinance is adopted by reference as if incorporated and set out in full in this chapter. The California State Model Water Efficient Landscaping Ordinance requirements shall apply to the following in addition to the applicable requirements of the California State Model Water Efficient Landscaping Ordinance:

(1) New and rehabilitated landscapes for private projects with a landscape area requiring any permit or application for approval from the City of Glendora.

(2) Any private project involving either the development of a new detached structure equal to or larger than 500 square feet in area.

(3) Any private project involving the addition to an existing structure shall replace their landscape on a 2:1 basis, for example a 500 square foot addition shall require a 1,000 landscape replacement which can include the landscape removed for the footprint of the addition being permitted. The project applicant shall be deemed compliant with this section upon presenting certification by a by a licensed landscape architect that the landscape to be replaced replacement area is already compliant with the most recent State Model Water Efficient Landscape Ordinance.

(4) All new residential construction, new roof installations, patio covers and additions, or when the building permit valuation for remodeling meets or exceeds $25,000 as established by the most recently adopted Master Schedule of Fees for Service, a minimum of two 50 gallon rain barrels shall be installed to capture roof rainwater runoff. The rain barrel capacity must be sufficient to capture the first ¾ inch of rain from the roof of the structure, or another means of retaining the water onsite must be approved by the Building Official. A roof drainage system, such as roof gutters, roof drains or scuppers directing the runoff to the rain barrels is required. The method for capturing the roof runoff is to be approved by the Building Official or his/her designee. Solar photovoltaic systems, mechanical, electrical and plumbing permits are exempted from this requirement;

(5) All property owners of existing single-family and 2-4 unit residential structures shall install a minimum of two 50 gallon rain barrels to capture roof rainwater runoff. The rain barrel capacity must be sufficient to capture the first ¾ inch of rain from the roof of the structure, or another means of retaining the water onsite must be approved by the Building Official by June 2017. A roof drainage system, such as roof gutters, roof drains or scuppers directing the runoff to the rain barrels will be required. The method for capturing the runoff is to be approved by the Building Official or his/her designee."

SECTION 4. Findings. There is a current and immediate threat to the public health, safety, or welfare caused by the statewide drought, as evidenced by Executive Order B-29-15, and the failure to take the actions and to adopt the regulations set forth herein could subject the City of Glendora to fines, and could threaten public health, safety, or welfare, in that: (1) there may not be sufficient water available to the public for basic living necessities; (2) there may not be sufficient water available to the public to fight fires; and (3) there may not be sufficient water available to preserve drought tolerant landscaping, which would adversely impact property values in the city.

SECTION 5. Severability. The provisions of this Ordinance are declared to be severable and if any section, sentence, clause or phrase of this Ordinance shall for any reason be held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining sections, sentences, clauses, and phrases of this Ordinance but they shall remain in effect, it being the legislative intent that this Ordinance shall stand notwithstanding the invalidity of any part.

SECTION 6. Effective Date/Term. The Mayor shall sign this ordinance and the City Clerk shall attest and certify to its passage. This Ordinance is hereby declared an urgency ordinance measure for the immediate preservation of the public health, safety and welfare and shall be effective immediately upon its adoption.

PASSED, APPROVED and **ADOPTED** this 26th day of May, 2015.

City Council of Glendora, California

BY: _____
KAREN K. DAVIS, Mayor

APPROVED AS TO FORM:

_____
D. WAYNE LEECH, City Attorney

CERTIFICATION

I, Kathleen R. Sessman, City Clerk of the City of Glendora, California, DO HEREBY CERTIFY that the foregoing Urgency Ordinance was duly approved and adopted at a Regular Meeting of the City Council on the 26th day of May, 2015, by the following roll call vote:

AYES:	COUNCIL MEMBERS:	Boyer, Nelson, Thompson, Murabito, and Davis
NOES:	COUNCIL MEMBERS:	None
ABSENT:	COUNCIL MEMBERS:	None
ABSTAIN:	COUNCIL MEMBERS:	None

Dated: May 27, 2015

KATHLEEN R. SESSMAN, City Clerk

APPENDIX D

CITY OF GLENDORA'S HAZARD MITIGATION PLAN

City of Glendora

Local Hazard Mitigation Plan

Public Review Draft
March 2025

PUBLIC REVIEW DRAFT

CITY OF GLENDORA
LOCAL HAZARD MITIGATION PLAN

CITY OF GLENDORA
150 S Glendora Avenue
Glendora, CA 91741
Contact: Julie Linger, Business Services Manager
Glendora Police Department

Prepared by:

DE NOVO PLANNING GROUP
180 E. Main Street, Suite 108
Tustin, California 92870
Contact: Starla Barker, AICP
(949) 396-8193

March 2025

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Section 1.0 | Introduction

Natural disasters can cause death and injuries, as well as significant damage to communities, businesses, public infrastructure, and the environment. Each year, natural disasters take the lives of hundreds of people and injure thousands more, and taxpayers pay billions of dollars annually to help recovery efforts. After disasters, repairs and reconstruction are often completed to simply restore the affected areas to their pre-disaster conditions. Such efforts expedite a return to normalcy; however, the replication of pre-disaster conditions results in a cycle of damage, reconstruction, and repeated damage. As the cost of damage from natural disasters continues to increase, communities realize the importance of identifying effective ways to reduce vulnerability to disasters. While it is not possible to prevent disasters from happening, their effects can be reduced or eliminated through well-organized public education and awareness efforts, preparedness, and mitigation. For those hazards that cannot be fully mitigated, the community must be prepared to provide efficient and effective response and recovery.

It is impossible to predict exactly when and where disasters will occur or the extent to which they will impact a community. However, with careful planning and collaboration among public agencies, stakeholders, and citizens, it is possible to minimize losses that may occur from disasters. Proactive mitigation planning helps reduce the cost of disaster response and, by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruption. For hazards that can be mitigated, the City should be prepared to implement efficient and effective short- or long-term actions where needed.

The City of Glendora developed their Local Hazard Mitigation Plan ("LHMP" or "Plan") to reduce future loss of life and property resulting from disasters, and to provide increased resiliency, allowing the City to return to normal sooner, with fewer impacts to people, facilities, and infrastructure. This LHMP is an update to the City of Glendora 2015 Natural Hazard Mitigation Plan.

1.1 PLAN PURPOSE

The purpose of the LHMP is to provide the City with clear direction for hazard mitigation action planning. This LHMP identifies natural and human-induced hazards that threaten the community and provides resources, information, and strategies to reduce these threats, resulting in overall risk reduction.

This plan focuses on the mitigation component of the cycle shown in Figure 1.1, *Disaster Response Cycle*. Hazard mitigation plays an important role in reducing the impacts of disasters by identifying effective and feasible actions to reduce the risks posed by potential hazards. The City is updating this plan to be consistent with current standards and regulations, ensuring that

the understanding of hazards facing its community reflects best available information and current conditions.

The LHMP does not supersede current City plans or strategies (such as the General Plan); rather it enhances the ability to identify, inform and mitigate hazard risks unique to the City. Information in this plan will be used to help guide and coordinate mitigation activities and serve as a tool for decision-makers to direct mitigation activities and resources.



Figure 1-1 Disaster Response Cycle

1.2 PLAN AUTHORITY

FEDERAL REQUIREMENTS

The Robert T. Stafford Disaster Relief and Emergency Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000 (DMA 2000), governs hazard mitigation planning activities like this one. While cities are not mandated to prepare a LHMP, the Stafford Act requires state, local, and tribal governments seeking federal hazard mitigation grant funds to submit a plan that outlines processes for identifying hazards, risks, and vulnerabilities (United States Code [USC] Title 42, Section 5156[a]). To implement the hazard mitigation planning requirements of the Stafford Act, the Federal Emergency Management Agency (FEMA) has issued regulations under Code of Federal Regulations (CFR) Title 44, Part 201. These regulations guide the planning process, content, and approval for hazard mitigation plans. This LHMP complies with the Stafford Act, DMA 2000, and the relevant sections of Title 44 CFR, including Parts 201, 206, and 322.

STATE REQUIREMENTS

California Government Code Section 8685.9 (Assembly Bill [AB] 2140) limits the State's share of disaster relief funds to 75 percent of the amount not covered by federal disaster relief, unless the jurisdiction has adopted a valid hazard mitigation plan that meets DMA 2000 standards. This plan must be incorporated into the jurisdiction’s general plan, which can be done through a resolution adopting the LHMP.

The City of Glendora is concurrently updating its General Plan Safety Element, which covers a range of hazards, including geological (seismic and soils), flooding, dam inundation, hazardous materials, fire risks, crime, medical emergencies, aircraft overflight, and climate change resilience. It also addresses disaster preparedness and community safety, ensuring coordination during disaster response situations.

This LHMP is consistent with current federal and State standards, as outlined by the Governor's Office of Emergency Services (CAL OES) and FEMA. It uses the best available information, reflects best practices, and aligns with community values. To comply with AB 2140, the City aims to meet all relevant federal and State requirements, ensuring Glendora is eligible for the appropriate benefits.

Once FEMA issues an Approvable Pending Adoption (APA) notification, the City will formally adopt the LHMP and incorporate it into the Safety Element of the General Plan via resolution. The General Plan Safety Element will reference the LHMP and provide information on how the public can access the current, approved version. Compliance with AB 2140 will be determined by CAL OES.

1.3 PLAN ADOPTION

The previous iteration of the LHMP was approved by Cal OES and FEMA in 2015, and this document serves as a comprehensive update in accordance with recent State and federal regulations. Following FEMA approval, the City Council of Glendora formally adopts the 2025 LHMP as an update to the 2015 LHMP. A copy of the resolution will be provided in Appendix A.

1.4 PLAN ORGANIZATION

The LHMP is organized into the following sections to reflect the logical progression of activities undertaken to develop the plan and includes all relevant documentation required to meet the necessary criteria for FEMA approval. Each section is briefly described below:

Section 1.0: Introduction describes the background and purpose of the plan, as well as the authority established for its development.

Section 2.0: Planning Process describes the LHMP update planning process, as well as the meetings and outreach activities undertaken to engage partner agencies, stakeholders, and the public.

Section 3.0: Community Profile provides the history, geography, and demographics of Glendora, including land use and development trends.

Section 4.0: Risk and Vulnerability Assessment identifies and profiles the natural hazards affecting the City, including their history, risk of future occurrence, and any effects climate change has on their frequency and intensity, where applicable. The selection and confirmation of hazards are also discussed. This section also identifies the vulnerability and risk to the community, including vulnerable populations, and critical facilities associated with each hazard.

Section 5.0: Hazard Mitigation Strategy identifies the specific hazard mitigation actions to reduce potential risks to the City's critical facilities, residents, and business owners to improve resiliency, and assesses the City's capabilities to implement and achieve the mitigation actions.

Section 6.0: Plan Maintenance discusses implementation of the plan, including the process to monitor, evaluate, update, and maintain the LHMP, and identifies opportunities for continued public involvement.

Section 7.0: References identifies the various resources utilized throughout development of the LHMP.

1.5 MITIGATION GOALS

The following goals from the 2015 Natural Hazard Mitigation Plan have been reconfirmed, with minor modifications, as part of the update to the Glendora LHMP:

- Protect Life and Property. Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural hazards.
- Enhance Public Awareness. Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards. Provide information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities that reduces vulnerabilities.
- Preserve Natural Systems. Support management and land use planning practices with hazard mitigation to protect life. Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions.
- Encourage Partnerships and Implementation. Strengthen communication and coordinate participation with public agencies, citizens, non-profit organizations, and businesses to support implementation. Encourage leadership within the City and public organizations to prioritize and implement local and regional hazard mitigation activities.
- Strengthen Emergency Services. Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure are prioritized. Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, and businesses. Coordinate and integrate hazard mitigation activities where appropriate, with emergency operations plans and procedures.

1.6 UPDATED COMMUNITY PRIORITIES

The priorities of the City relative to hazard mitigation remain similar to those in the 2015 LHMP. The mitigation goals were reviewed by the Planning Team and determined to be relevant with minor revisions to provide clarity and communicate priorities relative to hazard mitigation that reduces vulnerabilities.

The Community Profile was updated to reflect current demographic data and recent updates to the Glendora General Plan Housing Element. Major development projects have been identified, demonstrating continued growth and development/redevelopment within the City. Potential development to reflect the City's 2021-2029 Housing Element, which was required to include an inventory of land suitable and available for residential development to meet the City's regional housing need allocation (RHNA) of 2,276 units is identified. As part of the identification of sites, environmental constraints, including natural hazards were considered. The sites identified to accommodate the RHNA are primarily comprised of underutilized and vacant sites located within existing Specific Plans in proximity to transportation, and other urbanized areas. These sites are located within an area of the City considered to have reduced vulnerabilities specific to natural hazards.

The planning process for the update included a Project Management Team, led by the Business Services Manager of the Glendora Police Department who coordinated with the Principal Planner in the City's Planning Division relative to the LHMP and Safety Element Update. A Planning Team, comprised of City departments, neighboring cities, emergency responders, healthcare providers, school districts, utility providers, and other partner agencies, provided oversight and information specific to the LHMP update.

A comprehensive approach to community outreach was a primary focus of the Project Management Team. The outreach included a community survey, community outreach event, and six focus group meetings to provide expanded outreach to vulnerable populations. Discussions with the Planning Team and the results of the community survey and outreach indicate the community continues to be concerned with the hazards addressed within the LHMP. The hazards were expanded to include severe weather, consisting of Santa Ana winds and heavy rainstorms, and drought. The remaining hazards were updated to reflect changes since preparation of the 2015 LHMP.

The LHMP update includes a reorganization from the previous plan with a modernized template, structure, and framework for clarity and to streamline the plan. An expanded vulnerability assessment is included in the LHMP update to address vulnerable populations. Similarly, the mitigation strategy was updated to consider specific populations and areas of the City determined to experience higher vulnerability in the event of a hazard event. The mitigation actions were also revised to reflect mitigation actions that have been completed and identify priorities.

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Section 2.0 | Planning Process

This section describes each stage of the planning process used to develop the LHMP. The LHMP planning process provides a framework to document the plan's development and follows FEMA-recommended steps. The LHMP follows a prescribed series of planning steps which includes organizing resources, assessing risk, developing the mitigation plan, drafting the plan, reviewing and revising the plan, and adopting and submitting the plan for approval. Each step is described in this section.

Hazard mitigation planning in the United States is guided by statutory regulations described in the DMA 2000 and implemented through Title 44 CFR Parts 201 and 206. FEMA's hazard mitigation plan guidelines outline a four-step planning process for the development and approval of hazard mitigation plans. Table 2-1, *DMA 2000 CFR Crosswalk*, lists the specific CFR excerpts that contain the requirements for approval, and identifies the applicable section of this LHMP.

TABLE 2-1: DMA 2000 CFR CROSSWALK

DMA 2000 (44 CCFR 201.6)	Glendora LHMP Section
(1) Organize Resources	**Section 2**
201.6(c)(1)	Organize to prepare the plan
201.6(b)(1)	Involve the public
201.6(c)(2) and (3)	Coordinate with other agencies
(2) Assess Risks	**Section 4**
201.6(c)(2)(i)	Assess the hazard
201.6(c)(2)(ii) and (iii)	Assess the problem
(3) Develop the Mitigation Plan	**Section 5**
201.6(c)(3)(i)	Set goals (Section 1)
201.6(c)(3)(ii)	Review possible activities (actions)
201.6(c)(3)(iii)	Draft an action plan
(4) Plan Maintenance	**Section 6**
201.6(c)(5)	Adopt the plan
201.6(c)(4)	Implement, evaluate, and revise

2.1 FORMING THE PLANNING TEAM

PROJECT MANAGEMENT TEAM

The City of Glendora engaged De Novo Planning Group to assist in developing the Local Hazard Mitigation Plan (LHMP). A core Project Management Team, composed of City staff and the Consultant Team, was formed to oversee the organization, facilitation, and execution of the LHMP development process. This team was responsible for the day-to-day coordination of the LHMP work program. Key tasks included forming and assembling the Planning Team, scheduling and organizing Planning Team meetings, preparing and distributing meeting materials, coordinating community engagement activities and meetings, and managing document reviews.

LHMP PLANNING TEAM

The Project Management Team identified a list of participants, which included City staff, adjacent jurisdictions, partner agencies, service providers, and organizations, as potential LHMP Planning Team members. City Staff Planning Team members represented the following City Departments:

- Community Development
- Public Works
- Police Department
- Risk Management
- Human Resources

An invitation was sent via email to individuals advising them of the City's efforts to prepare an LHMP and requesting their participation in preparation of the plan, including an invitation for participation in the Planning Team meetings. The invitation included a request to identify a potential alternate if the specific contact was unable to participate, a copy of the correspondence is included in Appendix B. An invitation was sent to the following agencies and organizations:

- City of Azusa
- City of Covina
- City of San Dimas
- Los Angeles County Fire
- Los Angeles County Area D Disaster Management
- U.S. Forest Service
- Foothill Gold Line
- Los Angeles County Public Works (Flood)
- Southern California Edison
- Southern California Gas Company
- Emanate Health
- Pomona Valley Hospital
- Red Cross
- Glendora Unified School District
- Charter Oak Unified School District
- St. Lucy's Priory High School

- Citrus College
- Azusa Pacific University

The City received responses from some agencies and organizations expressing interest in participating directly on the Planning Team, and others indicating their inability to participate but willingness to provide information.

Together, the Planning Team worked to ensure the success of the planning process. The team's key roles and responsibilities included:

- Participation in Planning Team meetings
- Collection of local information and other requested data
- Providing agency-specific knowledge and input
- Assistance with the public engagement process
- Decision on plan process and content
- Development and prioritization of mitigation actions
- Review and comment on the draft LHMP

Table 2-2, *LHMP Planning Team*, identifies the Planning Team members that directly participated in the Planning Team meetings and their roles in the LHMP development process.

TABLE 2-2: LHMP PLANNING TEAM

Organization	Name, Title
City of Glendora Project Management Team	
City of Glendora Police Department	Julie Linger, Public Safety Management Analyst LHMP Lead
City of Glendora Planning Division	Hans Friedel, AICP, Principal Planner General Plan Safety Element Lead
City of Glendora	
City of Glendora Public Works	Jessica Clark, Business Services Manager
City of Glendora Risk Management	Marie Ricci, Administrative Services Director
City of Glendora Human Resources	Rita Wendling, Interim Assistant Director
City of Glendora Police Department	Matt Egan, Police Chief
City of Glendora Police Department	Mike Randazzo, Police Captain
City of Glendora Police Department	Chris Stabio, Police Captain
Neighboring Cities	
City of Azusa	Jennifer Wu, Emergency Manager
City of San Dimas	Anissa Livas, Senior Administrative Analyst
Emergency Service Providers	
Los Angeles County Fire	Noble Robinson, Battalion Chief
Los Angeles County Fire	Mike Inman, Assistant Fire Chief
Utility/Infrastructure Service Providers	
Southern California Gas Company	Ms. O'Shields, Public Affairs Manager
Hospitals/Health Care Agencies	
Pomona Valley Hospital	Steven Storbakken
Emanate Health	Angela Sharma
School Districts	
Glendora Unified School District	Tamra Fry, Safety/Risk Compliance Officer
Charter Oak Unified School District	Bob Lind, Director of Maintenance and Operations
Charter Oak Unified School District	Nate Cabibil, Maintenance Supervisor
Community Partners	
Red Cross	Nahomi Rodriguez
Red Cross	Ryan Chan, Disaster Program Manager

The LHMP Planning Team held three meetings, as summarized in Table 2-3, *Planning Team Meeting Summary*. The first two meetings included invitations to the entire Planning Team distribution list. Meeting 3 consisted of a focused group to focus on the existing plan's mitigation actions and progress toward the actions. Meeting materials, including PowerPoint presentations, sign-in sheets, agendas, meeting summaries, and other relevant handouts are provided in Appendix B.

TABLE 2-3: PLANNING TEAM MEETING SUMMARY

Meeting	Date	Discussion Items
1	June 28, 2023	• Introductions • Roles & Responsibilities • Project and LHMP Goals • Purpose and Requirements of the LHMP • Confirm Hazard and Identify Community Assets
2	July 26, 2023	• Hazards to be Profiled • Critical Facilities • Problem/Issue Statements • Capabilities Assessment • Review Mitigation Actions • Public Involvement Update
3	August 23, 2023	Mitigation Strategy – Review of existing mitigation actions and progress, discussion of ongoing mitigation actions and potential new mitigation actions to consider

As part of the Planning Team meetings, components of the plan and updates were reviewed and discussed. Clarifications and additional information were obtained from Planning Team participants. Separate from the Planning Team meetings, discussions occurred with individuals and organizations on the Planning Team, as well as outside of the Planning Team to obtain additional information to further inform the LHMP.

Upon preparation of the draft LHMP, each of the planning team participants were provided with a link to access the plan and provide comments and/or respond to request for additional information and clarification. Comments and additional information received on the draft LHMP were incorporated into the document.

PUBLIC OUTREACH AND ENGAGEMENT

A public outreach and engagement strategy was developed to solicit public involvement and input in the LHMP planning process. Components of the public outreach program are described below, refer to Appendix B for outreach materials.

Webpage and Social Media

A dedicated webpage on the City's website provided information on the LHMP, including a description of a hazard mitigation plan, its importance, and how the public could be involved in the planning process. A link to complete the community survey was provided along with a contact at the City for any comments or questions. Information on the City's website was available for the entirety of the LHMP development process. The website was updated throughout the planning process and provided notifications and access to LHMP materials. The draft LHMP was also made available for review.

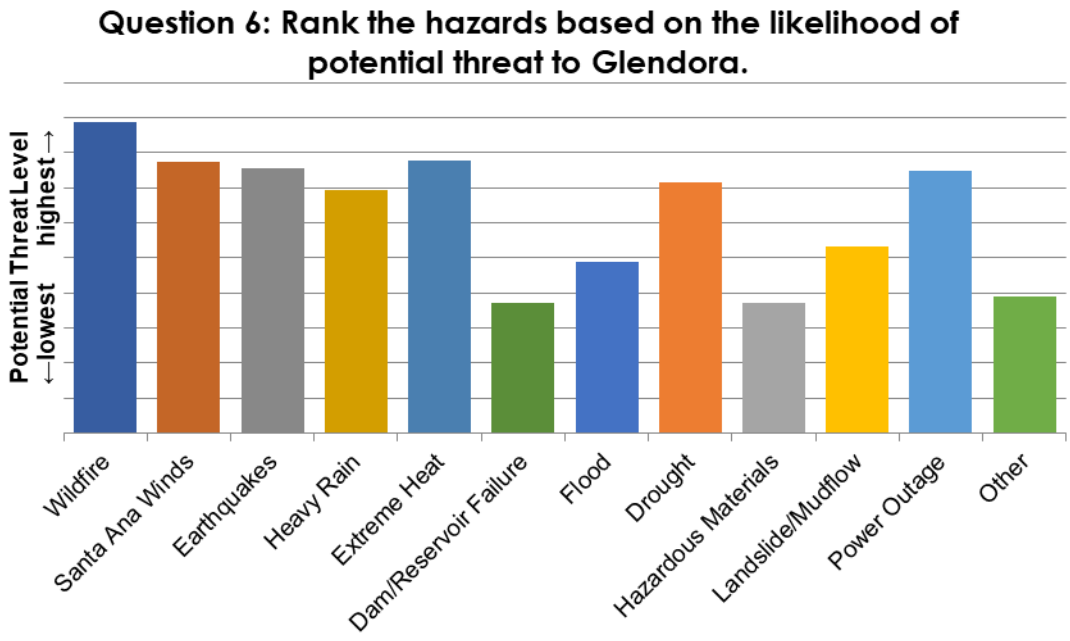
By conducting virtual outreach through the City's website, the City was able to reach a wide audience, including underserved and vulnerable populations who may have been unable to attend in-person events. Individuals were able to access all information at their own convenience and had the ability to communicate directly with City staff regarding questions or comments. Published content was also advertised via the City of Glendora's RSS Feed (subscription distribution lists) and social media channels.

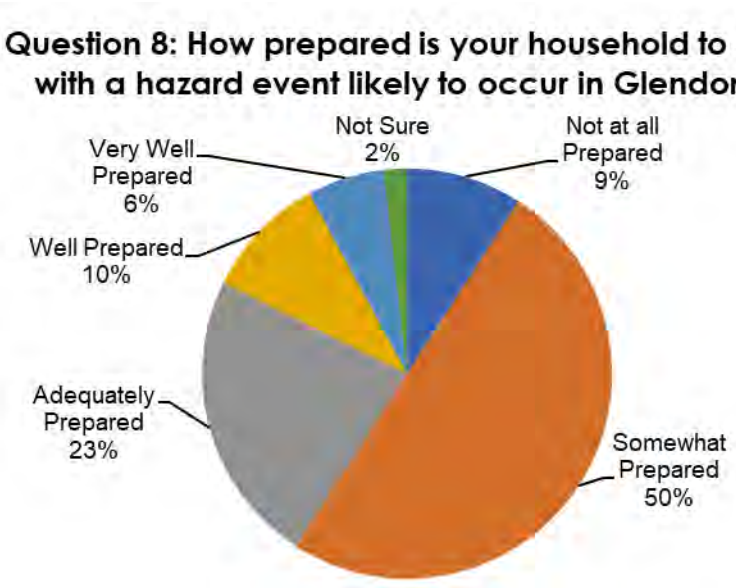
Community Survey

A community survey was developed to obtain input from the public about various hazard mitigation topics. In addition to basic demographic information, the survey asked residents to identify specific safety concerns, including what hazards they felt were most likely to impact their neighborhood or property. Residents were also asked what actions they had taken to be more resistant to hazards. Information gained from the survey was used by the Planning Team to identify potential mitigation actions that would reduce damage and disruption from disaster or emergency events and how best to improve communication and dissemination of information.

The survey was made available for completion on the LHMP webpage from August 16, 2023 to September 22, 2023, and the survey link was distributed via email by the City and Planning Team members. The survey link was also advertised and distributed at all Community Events, described below. The survey received 164 responses. Of the responses received, 59 respondents provided contact information. Input received was generally consistent with feedback received during one-on-one conversations at the community events and during the focus groups. Respondents were most concerned about wildfire, seismic hazards, drought, and high winds/Santa Ana wind events. Power outages that could occur because of hazard events were also identified as a significant concern. Respondents identified email, social media, city/agency website, and city/agency newsletters as the communication preference to receive information about reducing vulnerabilities to homes and neighborhoods. Nearly half (44.8 percent) of respondents felt that the City, County, and/or other agencies could help residents become better prepared for a disaster by increasing awareness of special needs and vulnerable populations.

Input received from the survey validated the hazards identified in the 2015 Natural Hazard Mitigation Plan, which have been retained and expanded upon in this LHMP update. The input was also considered when reviewing and developing mitigation actions specifically related to vulnerabilities, how the community can become better prepared, and the importance of preparedness, coordination, and response actions.


Question 6: Rank the hazards based on the likelihood of potential threat to Glendora.
Potential Threat Level
← lowest highest →
Wildfire
Santa Ana Winds
Earthquakes
Heavy Rain
Extreme Heat
Dam/Reservoir Failure
Flood
Drought
Hazardous Materials
Landslide/Mudflow
Power Outage
Other


Question 8: How prepared is your household to deal with a hazard event likely to occur in Glendora?
Not Sure 2%
Not at all Prepared 9%
Very Well Prepared 6%
Well Prepared 10%
Adequately Prepared 23%
Somewhat Prepared 50%

Focus Groups



Six focus group meetings were conducted to provide an opportunity for outreach to specific groups and organizations to ensure diversity in the public participation process, and to obtain input directly from and relative to populations deemed more vulnerable to natural hazards within the community. As part of the meetings, an overview of hazard mitigation and the LHMP update process was provided. The participants were asked to provide input on issues or concerns related to the specific hazards and potential mitigation actions. Attendees engaged in an open discussion guided by questions specific to the group. The Project Management team met with the following groups and organizations:

- La Fetra Center. The La Fetra Center, in coordination with the City Recreation & Human Services Department, provides programs, services, and activities to older residents. Members of the Project Management Team attended a regularly scheduled lunch program providing meals to residents 60 years of age and older on April 16, 2024. The conversation focused on concerns about evacuation, especially for older people who are not able to drive or have other special needs, and how emergency information is communicated and received. This also provided an opportunity to inform the attendees of the emergency alert system.
- The Los Angeles Centers for Alcohol and Drug Abuse (LACADA). LACADA is the leading provider of alcohol and drug abuse services in Los Angeles. The Project Management Team met with LACADA-associated partners including representatives from Homeless Outreach, Housing Navigator, and the Glendora Police Department on April 16, 2024. The discussion focused on topics related to the unsheltered population and provided the Planning Team with additional knowledge to supplement statistical data on vulnerable populations.
- Youth Advisory Board. The Glendora Youth Advisory Board is a volunteer advisory and social group consisting of students aged between 12 and 17. The Project Management Team met with members of the Youth Advisory Board on April 16, 2024. The discussion focused on awareness of hazards and concerns of school-age youth. This information was used to supplement statistical data on vulnerable populations.
- Glendora Chamber of Commerce. The Glendora Chamber of Commerce is a voluntary organization of businesses who band together to encourage and promote a positive, balanced, and vital economy. The Project Management Team met with the Chamber on April 17, 2024. The meeting focused on topics related to businesses and their employees, including channels of communication during and after a hazard event and emergency preparedness, particularly for smaller businesses.
- Charter Oak Unified School District (USD) Parent Workshop. The Charter Oak USD provides several resources to parents of students. The Project Management Team met with eight

parents during a workshop event on April 17, 2024. Due to the presence of non-English speakers, the presentation and discussion were translated into Spanish. The discussion focused on non-English speaking parents with school-age children. Information obtained from the focus group was used to supplement statistical data on vulnerable populations.

- Glendora USD Safety Committee Meeting. The Glendora USD Safety Committee is a committee of parents dedicated to student safety. The Project Management Team met with the Safety Committee during a regularly scheduled meeting on April 17, 2024. The discussion focused on parents with school-age children and existing hazard mitigation activities conducted at schools. This information was used to supplement statistical data on vulnerable populations.

Similar to the community survey, discussions and input received from the focus groups further validated the hazards identified in the 2015 Natural Hazard Mitigation Plan, which have been retained and expanded upon in this LHMP update. The input also helped identify and reconfirm what worries people the most when they consider the potential impacts of a hazard event. This information was considered when reviewing and developing mitigation actions specifically related to vulnerable populations.

Community Events

The Project Management Team hosted a booth at community events to inform the public about the LHMP update process, obtain feedback on hazards, and encourage completion of the survey. A raffle was held to engage and encourage participation. The community events included the Glendora Emergency Preparedness Day (Prepare Fair) on September 14, 2023, and an Earth Day event on April 20, 2024.



Public Review Draft LHMP

A public review draft LHMP was originally made available to the public for review and comment, beginning March 6, 2025 and ending April 4, 2025. The draft LHMP was made available on the City's LHMP webpage and at the City's Planning counter. The Planning Team assisted in advertising availability of the draft LHMP through their email distribution lists and social media. Information was provided on how to submit comments or ask questions regarding the draft LHMP.

REVIEW AND INCORPORATE EXISTING INFORMATION

The LHMP Planning Team referenced a variety of plans, studies, data, and technical reports available from local, State, and federal sources to prepare the LHMP. Primary resources reviewed and incorporated as part of the LHMP planning process are listed in Table 2-4, *Primary Plan Resources*. A complete list of resources is included in Section 7.0, References.

TABLE 2-4: PRIMARY PLAN RESOURCES

Plans, Studies, Reports and Other Technical Data/Information	Planning Process/Area of Document Inclusion
Agency for Toxic Substances and Disease Registry /Center for Disease Control's (CDC) Social Vulnerability Index (SVI)	Vulnerability Assessment
Cal Fire	Hazard Profiles, Vulnerability Assessment, Mitigation Strategy
Cal-Adapt	Hazard Profiles, Vulnerability Assessment, Mitigation Strategy
California Department of Water Resources	Hazard Profiles, Vulnerability Assessment
California Geological Survey	Hazard Profiles, Vulnerability Assessment
California State Hazard Mitigation Plan	Hazard Profiles
City of Glendora General Plan	Community Profile, Hazard Profiles, Mitigation Strategy
County of Los Angeles All-Hazards Mitigation Plan	Hazard Profiles, Vulnerability Assessment
FEMA Local Mitigation Planning Handbook, May 2023	Multiple plan sections
FEMA Local Mitigation Planning Policy Guide, Effective April 19, 2023	Multiple plan sections
FEMA Community Lifelines Implementation Toolkit	Stakeholder identification and outreach
FEMA Guide to Expanding Mitigation	Stakeholder identification and outreach, Vulnerability Assessment, Mitigation Strategy
FEMA National Risk Index	Hazard Profiles, Vulnerability Assessment
FEMA Map Service Center	Hazard Profiles, Vulnerability Assessment
National Drought Mitigation Center	Hazard Profiles, Vulnerability Assessment
U.S. Census American Community Survey	Community Profile, Vulnerability Assessment
U.S. Drought Monitor	Hazard Profiles, Vulnerability Assessment

2.2 ASSESS RISKS

In accordance with FEMA requirements, the LHMP Planning Team identified and confirmed the natural hazards affecting Glendora and assessed the community's associated vulnerability from those hazards. Results from this phase of the LHMP planning process aided subsequent identification of appropriate mitigation actions to reduce risk from these hazards, refer to Section 5.0, Mitigation Strategy.

IDENTIFY/PROFILE HAZARDS

Based on a review of past hazards in the existing plan, as well as a review of existing plans, reports, and other technical studies, data, and information, the LHMP Planning Team determined if specific hazards were valid and identified other hazards that could affect the City. Content for each hazard profile is provided in Section 4.0, Hazards Assessment.

ASSESS VULNERABILITIES

Hazard profiling exposes the unique characteristics of individual hazards and begins the process of determining which areas within the City are vulnerable to specific hazard events. The vulnerability assessment included input from the LHMP Planning Team and a GIS overlaying method for hazard risk assessments. Using these methodologies, populations and critical facilities impacted by hazards were identified and potential loss estimates were determined where available. The vulnerability assessments for each hazard are provided in Section 4.0.

2.3 DEVELOP MITIGATION PLAN

IDENTIFY GOALS

The City's previously adopted 2015 Natural Hazard Mitigation Plan provided relevant information in preparation of this LHMP, including the identification of mitigation goals. The Planning Team reviewed the previously developed goals and upon discussion, the mitigation goals were reconfirmed, with minor modifications, to guide the specific mitigation actions aimed at reducing risk and preventing loss associated with natural hazards. The Mitigation goals are presented in Section 1.5, Mitigation Goals.

DEVELOP CAPABILITIES ASSESSMENT

A capabilities assessment is a comprehensive review of all the various mitigation capabilities and tools currently available to the City to implement the mitigation actions prescribed in the LHMP. The LHMP Planning Team identified the planning and regulatory, administrative and technical, financial, and education and outreach capabilities to implement mitigation actions, as detailed in Section 5.0.

IDENTIFY MITIGATION ACTIONS

As part of the LHMP planning process, existing mitigation actions were reviewed to assess whether they had been completed, were in progress or on-going, or continued to be relevant. New mitigation actions were also identified and developed. The mitigation actions were prioritized as high, medium, or low. The process was informed by the identification of the hazards, problems/issues statements identified by the Planning Team, input received as part of the community outreach, and vulnerability assessment. During this process, the capabilities assessment was also referenced to better understand if the capability already existed and needed to be expanded, or if the capability was not currently available. A detailed discussion of the identification and prioritization of mitigation actions is provided in Section 5.0.

PLAN REVIEW AND REVISION

As previously noted, once the draft LHMP was completed, a public review period was provided from March 6, 2025 to April 4, 2025, to allow public review and comments. Comments received on the draft LHMP were reviewed and the LHMP was revised, as appropriate.

PLAN ADOPTION AND SUBMITTAL

This plan will be submitted to Cal OES and FEMA for review. Upon receiving “approvable pending adoption” notification from FEMA, this plan will be presented to the City Council for their consideration. If approved, a copy of the resolution will be provided in Appendix A.

PLAN MAINTENANCE

Plan maintenance procedures, found in Section 6.0, Plan Maintenance, include the measures the City will take to ensure the LHMP’s continuous long-term implementation. The procedures also include the way the LHMP will be regularly monitored, reported upon, evaluated, and updated to remain a current and meaningful planning document.

Section 3.0 | Community Profile

3.1 GEOGRAPHY AND ENVIRONMENT

The City of Glendora covers approximately 19.6 square miles (about 12,540 acres) in eastern Los Angeles County. It is located at the intersection of the 57 and 210 freeways, in the foothills of the San Gabriel Mountains. Glendora is bordered by the Angeles National Forest to the north, the City of Azusa to the west, the City of Covina to the south, and the City of San Dimas to the east (see Figure 3-1, *Regional Vicinity*, and Figure 3-2, *City and Sphere of Influence*). Additionally, the City's Planning Area includes about 260.5 acres of unincorporated Los Angeles County within its sphere of influence (SOI).

Two predominant terrain types are located within Glendora: alluvial fan and foothill. The alluvial fan portion of the City is characterized by gently to moderately sloping areas within the City where a vast majority of urban development has already occurred. The foothill portion of the City is characterized by moderate to very steep hillsides predominantly located along the northern boundary adjacent to the Angeles National Forest. In addition, a small area known as "South Hills" located in the southern portion of the City is also characterized by foothill terrain. Elevations in the City range from 776 feet to 3,600 feet.

The nearest major river is the San Gabriel River, which traverses northwest section of the Planning Area. According to the State Water Resources Control Board, the San Gabriel River receives drainage from 689 square miles of eastern Los Angeles County; its headwaters originate in the San Gabriel Mountains. The river itself does not pose any significant impact on the City; its channel is typically dry and only carries substantial water flow during major rainstorms.

3.2 CLIMATE

Temperatures in the City of Glendora typically range from 45 degrees Fahrenheit in the winter months to over 92 degrees Fahrenheit in the summer months. However, the temperatures can vary over a wide range, particularly when the Santa Ana winds blow, bringing higher temperatures and very low humidity. Temperatures occasionally exceed 100 degrees Fahrenheit in the summer months (June-September), and rarely drop below 30 degrees Fahrenheit in the winter months (November-March). Rainfall in the City averages less than three inches of rain per month. Actual rainfall in the southern California region tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals.

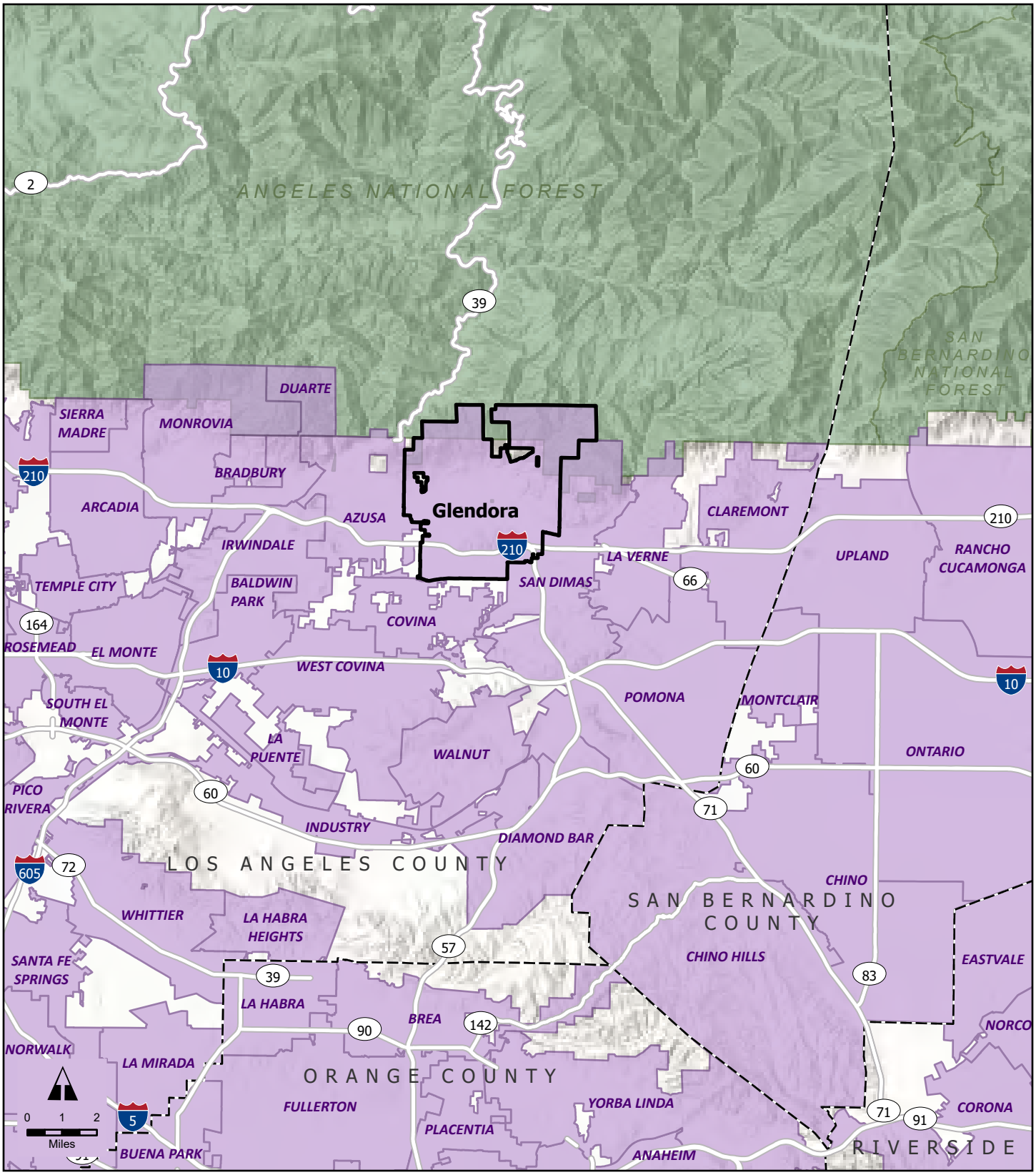
3.3 HISTORY

The City of Glendora was founded in 1887 and incorporated in 1911. According to the City's General Plan Historic Preservation Element, Glendora's rich history traces back to the presence of the Gabrielino Indians, dating as far back as 6000 B.C. During the era of Mexican governance, the area now known as Glendora was part of a Mexican land grant, which was acquired by British merchant Henry Dalton in 1844. Following the Mexican-American War, the Treaty of Guadalupe Hidalgo was signed in 1848, ceding California's lands to the United States.

The town's development began in the late 1880s under the leadership of George Dexter Whitcomb, who named it "Glendora" by combining the word "glen" with his wife Leadora's name. Glendora grew rapidly in the late 19th and early 20th centuries, fueled in part by the arrival of the Pacific Electric Railway in 1907, which connected the town to neighboring cities and spurred further expansion.

Agriculture, particularly citrus farming, was the cornerstone of Glendora's early economy. The region’s mild climate and fertile soil made it an ideal location for citrus cultivation, and cooperatives were established to support this thriving industry. In addition to agriculture, social, educational, and religious institutions flourished, with organizations such as the Glendora Women's Club, the Masonic Lodge, and various churches playing vital roles in the town's growth. Glendora officially became a city in 1911, marking a significant milestone in its development.

As time passed, Glendora saw substantial economic growth, including key infrastructure projects, residential expansion, and the development of industrial and commercial sectors. Today, more than 50,000 residents call Glendora home, enjoying excellent public and private schools, parks, and community services. The City is also known for its safety, boasting one of the lowest crime rates in Los Angeles County.



LEGEND

- Glendora City Limits
- Incorporated Area
- County Boundary
- National Forest Lands

CITY OF GLENDORA, CALIFORNIA

Figure 3-1. Regional Vicinity

Sources: Los Angeles County GIS; Southern California Association of Governments; USFS; MAXAR Imagery 4/4/2021. Map date: November 13, 2024.

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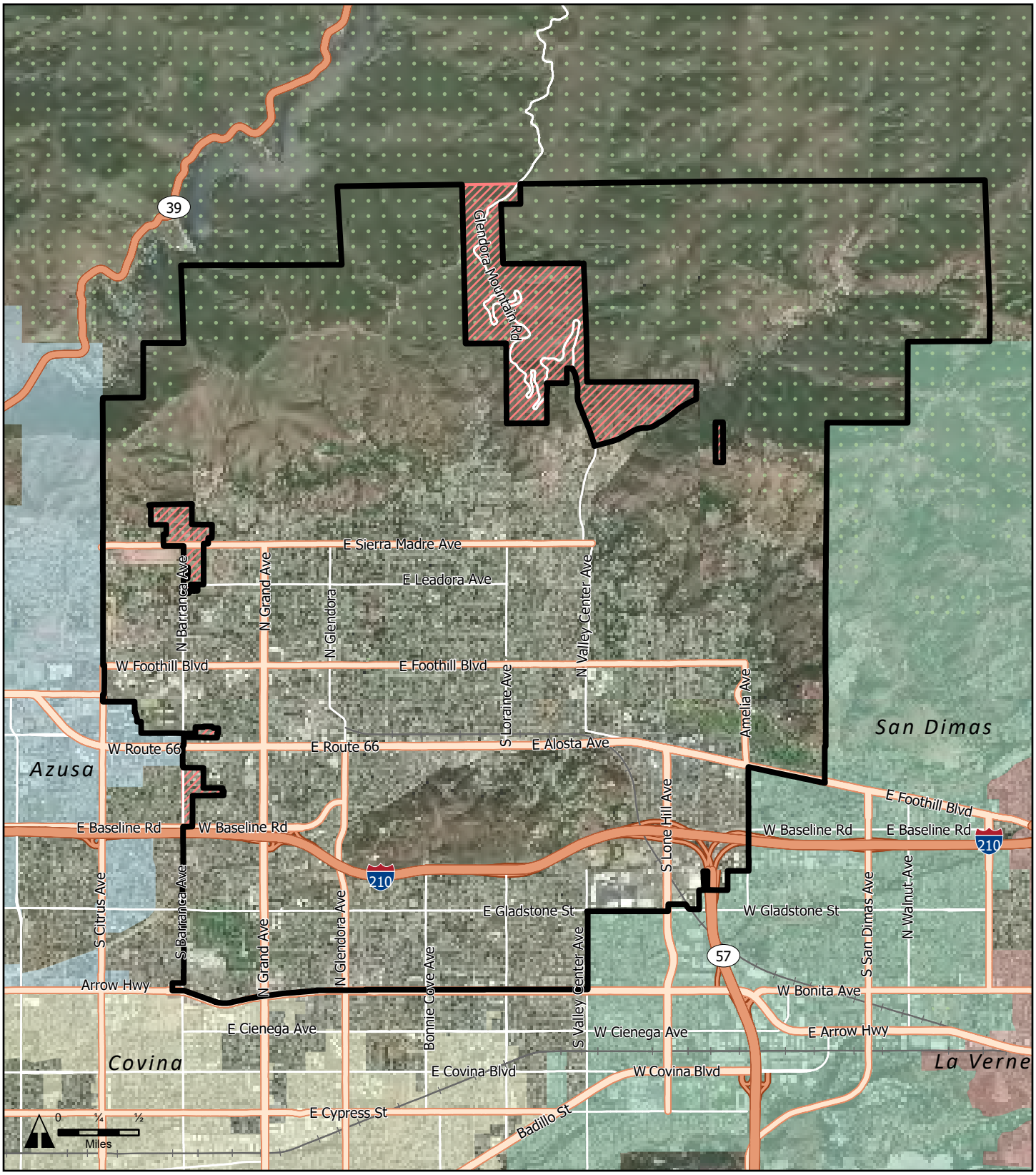

LEGEND

- Glendora City Limits
- Angeles National Forest
- Glendora Sphere of influence (SOI)

Other Incorporated Areas

- Azusa
- Covina
- La Verne
- San Dimas

CITY OF GLENDORA, CALIFORNIA

Figure 3-2. City and Sphere of Influence

Sources: Los Angeles County GIS; Southern California Association of Governments; USFS; MAXAR Imagery 4/4/2021. Map date: November 13, 2024.

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3.4 DEMOGRAPHICS

Basic demographic data for Glendora (population, education, employment, and housing) obtained from the US Census 2018-2022 American Community Survey (ACS) is summarized below.[1]

POPULATION

Table 3-1, *Glendora and Los Angeles County Population and Housing Data (2022)*, provides an overview of the City's and County's demographics.

TABLE 3-1: GLENDORA AND LOS ANGELES COUNTY POPULATION AND HOUSING DATA (2022)

Category	Glendora	Los Angeles County
Total Population	52,095	9,936,690
Percent of Residents that are children (under 18 years)	22.4%	21.1%
Percent of Residents that are senior citizens (65 and over)	16.8%	14.2%
Median Age (years)	40.4	37.4
Median Household Income	$106,718	$83,411
Median House Value	$749,400	$732,200
Occupied Housing Units	16,751	3,363,093
Percent of Renter Occupied	32.1%	53.8%

Source: US Census American Community Survey 5-Year Estimates 2018-2022.

Glendora's 2022 estimated population is 52,095 residents. When compared to Los Angeles County, the City has a higher household income, home ownership rate, and median house value. The median age of City residents is 40.4, higher than the median age of County residents at 37.4. The City has a higher percentage for both residents under 18 and residents over 65 when compared to the County. Approximately 22.4 percent of the City's population is below the age of 18 and approximately 16.8 percent is above the age of 65.

A greater percentage of Glendora residents identify as white when compared to Los Angeles County; refer to Table 3-2, *Glendora and Los Angeles County Racial and Ethnic Composition (2022)*. Hispanic or Latino persons of any race constitute 40.0 percent of the City's residents compared to 48.7 percent of County residents. Persons identifying as Asian make up 11.2 percent of the population. Persons identifying as "some other race" account for 12.4 percent of the population, while those reporting two or more races make up 16.1 percent of the City's population.

[1] The 2018-2022 American Community Survey (ACS) 5-year estimates is the most current 5-year data profile available. It represents 60 months of collected data and provides the most reliable and largest data set.

TABLE 3-2: GLENDORA AND LOS ANGELES COUNTY RACIAL AND ETHNIC COMPOSITION (2022)

Category	Glendora		Los Angeles County	
	Population	Percentage of Population	Population	Percentage of Population
White	29,386	56.4%	3,937,901	39.6%
Black or African American	1,286	2.5%	780,993	7.9%
American Indian and Alaskan Native	660	1.3%	111,096	1.1%
Asian	5,859	11.2%	1,473,634	14.8%
Native Hawaiian and Other Pacific Islander	54	0.1%	23,400	0.2%
Some Other Race	6,464	12.4%	2,253,956	22.7%
Two or More Races	8,386	16.1%	1,355,710	13.6%
Hispanic or Latino (of any race)[1]	20,863	40.0%	4,837,594	48.7%
Total	**52,095**	**100%**	**9,936,690**	**100%**

Source: US Census American Community Survey 5-Year Estimates 2018-2022.

Notes:

1. Hispanic or Latino persons are not counted as a separate racial or ethnic category; persons who identify as Hispanic or Latino are also included in other racial or ethnic categories.

EDUCATIONAL ATTAINMENT

When compared to Los Angeles County, residents of Glendora exhibit higher levels of educational attainment (see Table 3-3, *Glendora and Los Angeles County Educational Attainment (2022)*). Among Glendora residents aged 25 and older, 14.1 percent hold a graduate or professional degree, 23.2 percent have earned a bachelor's degree, and 11.1 percent possess an associate degree. Additionally, only 3.9 percent of adults in Glendora have not completed high school, in contrast to 8.0 percent of adults across the broader Los Angeles County.

TABLE 3-3: GLENDORA AND LOS ANGELES COUNTY EDUCATIONAL ATTAINMENT (2022)

Educational Attainment (25 years and older)	Glendora		Los Angeles County	
	Population	Percentage of Population	Population	Percentage of Population
Less than 9th Grade	1,178	3.3%	811,822	11.7%
9th to 12th Grade, no diploma	1,411	3.9%	552,831	8.0%
High School Graduate	7,800	21.6%	1,412,260	20.4%
Some College, No Degree	8,232	22.8%	1,260,211	18.2%
Associate Degree	4,000	11.1%	482,967	7.0%
Bachelor's Degree	8,381	23.2%	1,542,422	22.3%
Graduate or Professional Degree	5,101	14.1%	847,137	12.3%
Total	**36,103**	**100**	**6,909,650**	**100**

Source: US Census American Community Survey 5-Year Estimates 2018-2022.

EMPLOYMENT

Of the 41,954 residents over 16 years of age, almost two-thirds (61.9 percent or 25,964 residents) are in the labor force. Out of the 25,964 people in the labor force, 24,366 (58.1 percent) are employed and 1,589 (3.8 percent) are unemployed. The educational services and health care/social services sector employ the largest number of City residents (28.5 percent), followed by retail trade (10.8 percent), and professional scientific, management, and administrative and waste management services (9.2 percent). The median household income in the City is $106,718. While approximately 13.2 percent of employees work from home, a majority of Glendora' residents commute outside of the City for work. The average commute travel time is 33.6 minutes.

HOUSING AND HOUSEHOLD CHARACTERISTICS

In 2022, Glendora had a total of 16,751 occupied housing units (households) (see Table 3-4, Glendora and Los Angeles County Household Characteristics (2022)). The predominant housing type in the city is single-family detached units, which make up approximately 70.3 percent of the housing stock. According to the U.S. Census ACS 5-Year Estimates (2018-2022), about 74.1 percent of Glendora's existing housing was built between 1940 and 1979.

TABLE 3-4: GLENDORA AND LOS ANGELES COUNTY HOUSEHOLD CHARACTERISTICS (2022)

Household Type	Glendora		Los Angeles	
	Population	Percent	Population	Percent
Families	12,834	76.6%	2,218,646	66.0%
With related children of householder under 18 years	5,951	35.5%	1,045,971	31.1%
Housholder Living Alone	3,074	18.4%	870,733	26.0%
65 Years and Older	1,556	9.3%	301,059	9.0%
Non-family	3,917	23.4%	1,144,447	34.0%
Total Households	16,751	100%	3,363,093	100%
Average Household Size	3.04		2.89	
Average Family Size	3.45		3.56	

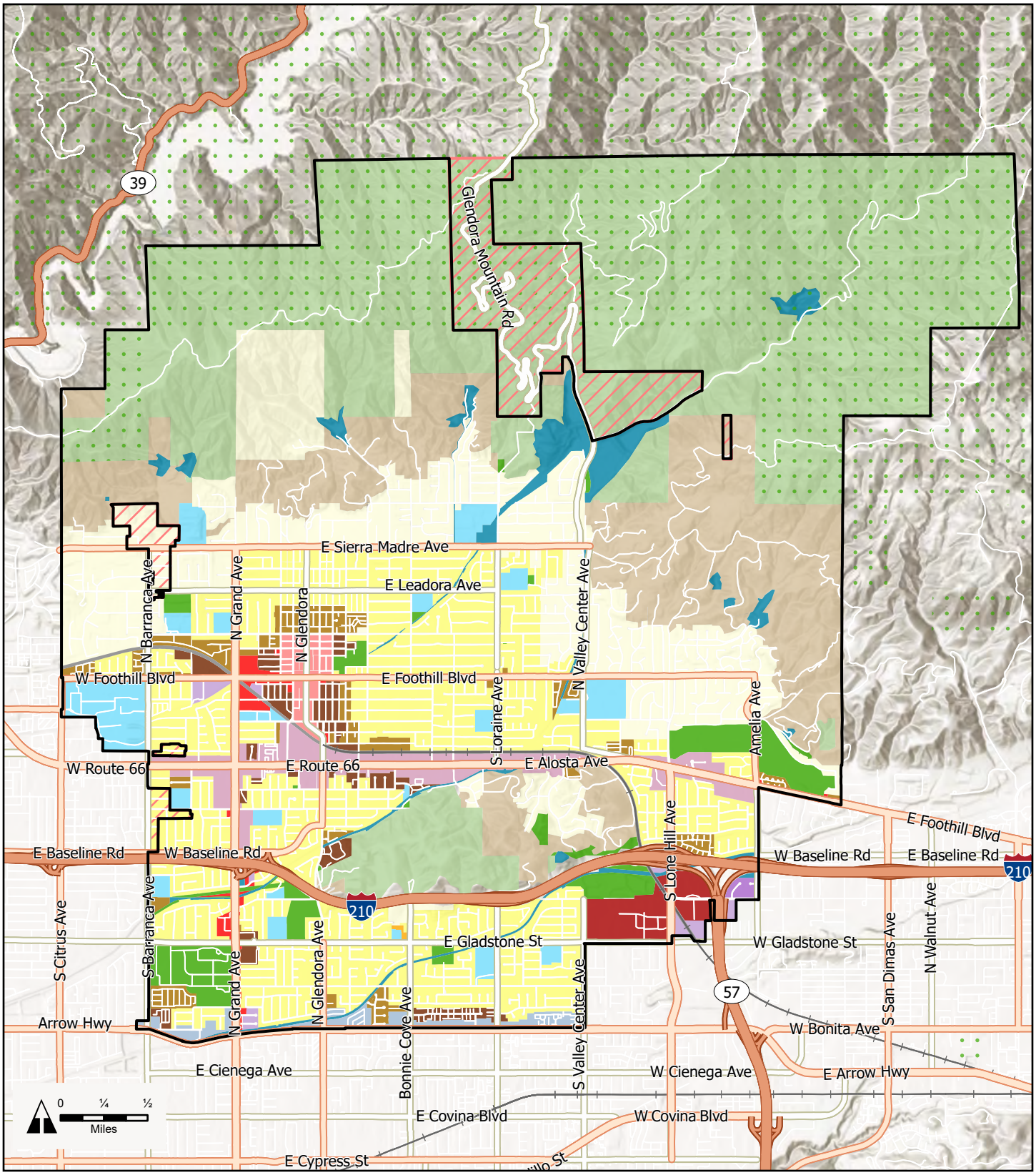
Source: US Census American Community Survey 5-Year Estimates 2018-2022.

In Glendora, families constituted 76.6 percent of the 16,751 housing units in the City, which represents a relatively higher proportion than in Los Angeles County (66.0 percent). Families with children represented 35.5 percent of households in Glendora and 31.1 percent in Los Angeles County. Single-person households represented 18.4 percent of households in Glendora, which is lower than the proportion of single-person households in Los Angeles County (26.0 percent).

Household size identifies sources of population growth and household overcrowding. In general, a city's average household size will increase over time if there is a trend toward larger families. In communities where the population is aging, the average household size may decline. The average household size for Glendora in the 2018-2022 period was 3.04, which was higher than Los Angeles County, with an average household size of 2.89.

3.5 LAND USES AND EXISTING DEVELOPMENT

The development of Glendora is directed by its General Plan, which assigns land use designations to all areas within the city's planning boundary (see Figure 3-3, *General Plan Land Use Map*). Table 3-5, *Land Use Designations*, outlines the current land use designations and provides descriptions of the typical uses permitted in each designation. Additionally, Table 3-6, *Glendora Development Capacity (2025)*, details the development capacity projected for the city under the General Plan.



LEGEND

- Glendora City Limits
- Sphere of Influence
- Angeles National Forest
- Hillside Very Low Density
- Low Density
- Low/Medium Density
- Medium Density
- Medium/High Density
- High Density
- General Commercial
- Regional Commercial
- Light Industrial
- General Industrial
- Civic/Institutional
- Utility and Flood Control
- Conservation Open Space
- Open Space
- Railroad
- Arrow Highway Specific Plan
- Route 66 Specific Plan
- Village Mixed Use

Sources: City of Glendora Public Map Viewer, accessed 3-7-2024; Los Angeles County GIS; Southern California Association of Governments; USFS. Map date: November 13, 2024.

CITY OF GLENDORA, CALIFORNIA

Figure 3-3. General Plan Land Use Map

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TABLE 3-5: LAND USE DESIGNATIONS

Land Use	Maximum DUs or Maximum FAR	Summary Description of Land Use Designation
Residential Land Use		
Hillside Very Low Residential	1 du/ac	The Hillside Density Residential Designation is intended for hillside areas and allows for the development of single-family residential development on lots of at least one acre in size. The preservation of natural hillside features is strongly encouraged within this land use designation.
Low Density Residential	3 du/ac	Low Density Residential Designation is intended for the transitional areas between hillside areas and higher density single-family residential areas. This designation allows for the development of single family residential on lots ranging from 10,500 to 30,000 square feet.
Low/Medium Density Residential	6 du/ac	Low/Medium Density is the most intensive designation for single-family residences and encompasses most of the non-hillside areas. This designation allows for the development of the smallest detached single-family residential lots and the typical lots range in size from 7,500 to 8,500 square feet in size.
Medium Density Residential	11 du/ac	Medium Density Residential Designation allows for multiple and single family attached housing and is a transitional between the detached single-family areas and the higher density multiple family areas. This designation allows for a variety of housing types including small-lot single family, apartments, duplexes, condominiums, and townhouses.
Medium/High Density Residential	15 du/ac	Medium/High Density allows for multiple and single family attached housing and is transitional between the lower density attached housing areas and the higher density multiple family areas. Medium/High Density allows for a variety of housing types including apartments, duplexes, townhouses, and patio homes.
High Density Residential	25 du/ac[1]	High Density is the most intensive residential land use designation. This designation is found along major and secondary arterials and is used as a transition between the other residential land uses and the more intensive non-residential land uses. Development at this density requires consideration of internal and external circulation, the relationship of buildings and units to each other, and the provision of common open space and private outdoor living areas.
Mixed Use		
Village Mixed Use	30 du/ac/ up to 1.0 FAR	The Village Mixed Use Designation is intended to preserve and enhance the unique character of the

Land Use	Maximum DUs or Maximum FAR	Summary Description of Land Use Designation
		Village area and to encourage a mix of complimentary development. Encouraged development includes professional offices, public/quasi-public facilities, retail businesses, small-lot single family and multiple family residential developments.
Commercial		
General Commercial	0.5 FAR	The General Commercial designation is intended for general commercial uses. These include retail businesses, professional offices, automotive services, and other similar businesses. Development may take the form of single or multi-tenant establishments, including shopping centers.
Regional Commercial	0.5 FAR	The Regional Commercial designation is intended to encourage the development of regionally serving commercial development. The intended uses within this designation include major department stores, specialty retail outlets, restaurants, offices, automobile dealerships, hotel, and other complementary uses.
Industrial		
Light Industrial	0.35 FAR	The Light Industrial designation is intended to encourage general industrial uses which are compatible with surrounding land uses, and which would not degrade the character of adjacent neighborhoods. This designation is intended to serve business parks, research, and development, technology centers, corporate and office uses, “clean” industry and support retail uses, auto truck and equipment sales, warehousing, and distribution.
General Industrial	0.35 FAR	The General Industrial designation is intended for more intensive industrial uses, such as manufacturing, fabrication, assembly, processing, trucking, warehousing and distribution, equipment, and servicing. Uses include industrial research, assembly, and testing of electronics, instruments, and office and related machinery, wholesaling, warehousing, administrative offices, and regional or home offices of industry.
Other		
Civic/Institutional	--	The Civic/Institutional designation includes educational uses, such as primary and high schools, colleges, universities hospitals, and governmental facilities.
Utility and Flood Control	--	The Utility and Flood Control designation is intended to designate those areas in the city that are developed for utility and flood control use.

Land Use	Maximum DUs or Maximum FAR	Summary Description of Land Use Designation
Route 66 Corridor Specific Plan	Various	The Route 66 Corridor Specific Plan designation allows for the implementation of a complimentary mix of land uses, consistent with the policies and regulations contained within the Specific Plan that governs land uses within a particular area. The Specific Plan land use designation provides for tailored development standards, design guidelines and other policy and regulatory elements that guide future land use and improvements.
Arrow Highway Specific Plan	Various	The Arrow Highway Specific Plan implements the City's vision for its southernmost corridor by fostering livability, housing, retail, and service options; improving and integrating open space and community spaces; encouraging catalytic projects; and improving mobility. The Specific Plan establishes development standards, parking standards, design guidelines, a mobility and infrastructure component, administration and implementation plan, and other requirements to ensure the orderly development of the Arrow Highway Specific Plan area.
Open Space		
Conservation Open Space	--	The Conservation Open Space designation includes areas that are publicly owned, undeveloped and will remain in a natural state. This designation is intended to protect areas with high scenic value, environmental and habitat sensitivity, and passive recreational facilities.
Open Space	--	The Open Space designation includes public and privately owned open space areas such as parks, golf courses, and cemeteries. The Open Space designation generally contains active and passive recreational facilities available for public use.

Source: City of Glendora, *General Plan Land Use Element*, 2006; City of Glendora, *Arrow Highway Specific Plan*, 2018.

Notes:

1. In the Grand-Foothill Multi-Family Residential Overlay Zone the residential density maximum may reach up to 30 dwelling units per acre.

TABLE 3-6: GLENDORA DEVELOPMENT CAPACITY (2025)

Land Use Designation	Acres	Percentage of the City Total	Potential DU (Minimum)	Potential DU (Maximum)	Potential SF
Residential					
Hillside Very Low Residential	1,907.01	15.21	191	1,907	
Low Density Residential	1,090.56	8.70	1,200	3,272	
Low/Medium Density Residential	1,874.28	14.95	5,810	11,246	
Medium Density Residential	109.21	0.87	666	1,201	
Medium/High Density Residential	134.44	1.07	1,492	2,017	
High Density Residential	125.19	1.00	1,890	3,130	
Total Residential	5,240.69	41.79	11,249	22,772	
Mixed Use					
Village Mixed Use	38.50	0.31	72	144	209,633
Total Mixed Use	38.50	0.31	72	144	209,633
Commercial					
General Commercial	97.14	0.77			1,480,996
Regional Commercial	114.56	0.92			1,746,582
Total Commercial	211.70	1.69			3,227,578
Industrial					
Light Industrial	30.14	0.24			459,514
General Industrial	39.55	0.32			602,979
Total Industrial	69.69	0.56			1,062,493
Other					
Civic/Institutional	346.82	2.77			
Route 66 Corridor Specific Plan	286.93	2.28	1,228	1,228	4,432,309
Utility and Flood Control ROW	267.39	2.13			
Street and Freeway ROW	1,382.24	11.02			
Railroad ROW	51.59	0.41			
Total Other	2,334.97	18.61			
Open Space					
Open Space	4,304.86	34.33			
Conservation Open Space	339.38	2.71			
Open Space	4,644.24	37.04			
Total – City Limits	**12,507.47**	**100.00**	**12,550**	**24,144**	**8,932,013**
Unincorporated Los Angeles County (SOI)	260.47				
Total – City and SOI	**12,800.26**				

Source: City of Glendora, *General Plan Land Use Element*, 2006.

3.6 DEVELOPMENT TRENDS AND FUTURE DEVELOPMENT

Glendora is an urbanized community that is largely built out, with limited vacant land available for new development. Since the adoption of the 2015 Natural Hazards Mitigation Plan, new development has primarily taken the form of infill development on underutilized sites within the City. The City Limits and Sphere of Influence (SOI) have not expanded since that time; however, the City of Glendora has experienced population growth and new development, while also adopting plans that support future development in specific areas of the city. Glendora's population has grown by approximately 2,022 people, or 4.0%, since 2015, while other demographic characteristics have remained largely unchanged.[2] Since preparation and adoption of the 2015 Natural Hazards Mitigation Plan, the City of Glendora has experienced population growth and new development and has adopted plans that provide opportunities for future development within specific areas of the City.

PROPOSED DEVELOPMENT

Table 3-7, *Major Development Projects*, shows current major development projects under construction, approved or proposed within the City. Major development projects include new residential construction of at least eleven dwelling units or more, and new commercial construction of 5,000 square feet (SF) or more.

[2] The 2015 Local Hazard Mitigation Plan estimated the City's population using the 2010 US Census population of 50,073.

TABLE 3-7: MAJOR DEVELOPMENT PROJECTS

Project Address	Project Name	Type of Development	Project Description	Status
Northwest Glendora	La Colina (Former Monrovia Nursery)	Residential	121 lot single-family subdivision	Under Construction
950 Silent Ranch	"Grand Estates"	Residential	12 Lot single-family subdivision	Approved
1121 E Arrow Highway	"Central Park"	Residential	19 3-story residential units in 3 attached buildings	Approved
531 E Arrow Highway	N/A	Residential	33 attached 3-story residential condo units	Approved
1237 Bonnie Cove Ave	Citrus Oak	Residential	30 Detached condo subdivision 2-story homes	Approved
630 W Foothill Blvd	N/A	Commercial	9,500 SF Medical Office	Approved
210 S Grand Ave	N/A	Commercial	20,974 SF Medical Office	Approved
400 N Glendora Ave	Cornerstone Bible Church Expansion	Institutional	New 9,287 SF Sanctuary	Approved
1201 E Arrow Hwy	N/A	Residential	46 attached 3-story residential condo units	Approved
1861 E Route 66	SkinPerfect Building	Commercial	6,232 SF Medical Office	Approved
1717 S Grand Ave	N/A	Commercial	Car Wash	Proposed
723 E Route 66	N/A	Residential	39 attached 3-story residential condo units -- zone change	Approved
1332 S Lone Hill	N/A	Industrial Service	47,800 SF industrial	Proposed
631-657 Arrow Highway	N/A	Residential	46-unit residential	Proposed
Southwest corner of Sunflower and Gladstone	Sunflower & Gladstone	Residential	81 detached & attached residential units	Proposed

Source: City of Glendora, *Current Development Projects*, https://www.cityofglendora.org/departments/economic-development/development-projects, accessed November 7, 2024.

GENERAL PLAN HOUSING ELEMENT UPDATE

The Southern California Association of Governments (SCAG) 6th Cycle Final Regional Housing Needs Assessment (RHNA) Allocation Plan was approved in March 2021 and identifies housing growth by county and city to accommodate projected population growth needs. On December 16, 2022, the City of Glendora adopted their Housing Element Update to accommodate the RHNA projected housing needs. The RHNA Allocation for Glendora is outlined in Table 3-8, *Glendora RHNA Allocation (2021-2029)*.

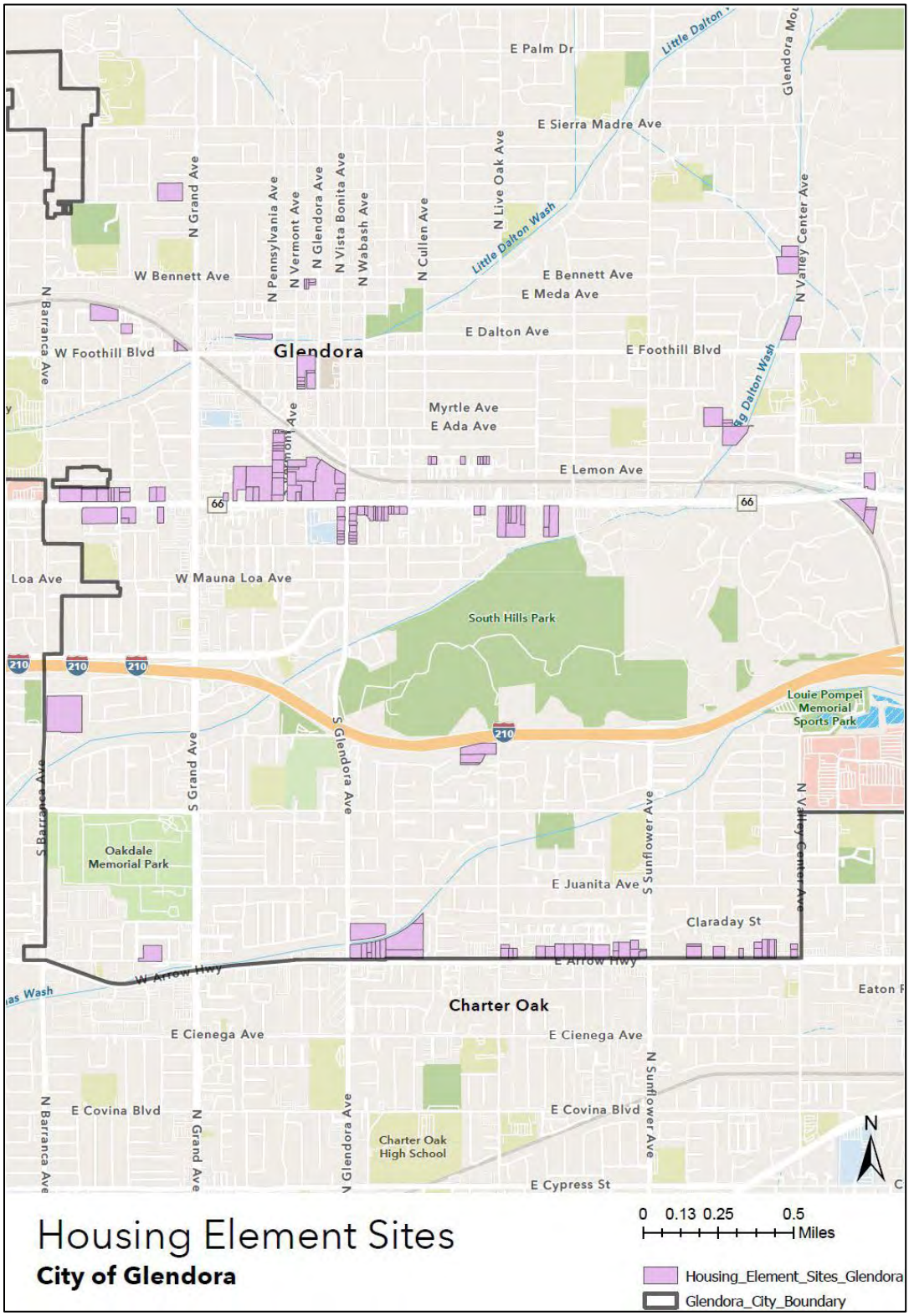
TABLE 3-8: GLENDORA RHNA ALLOCATION (2021-2029)

Income Category	2021-2029 RHNA
Extremely Low Income	368
Very Low	367
Low	386
Moderate	388
Above Moderate	767
Total	**2,276**

Source: Southern California Association of Governments, *SCAG 6th Cycle Final RHNA Allocation Plan*, 2021.

As shown in Table 3-6, the RHNA plan allocated 2,276 new housing units to Glendora for the October 2021 through October 2029 planning period. Although the City is required to provide adequate land to accommodate the 2,276 new housing units, the City is not required to build housing. The 2021-2029 Housing Element accommodates the RHNA through a combination of new residential and mixed-use development on identified underutilized and vacant sites, located primarily within the Route 66 Corridor Specific Plan, Arrow Highway Specific Plan, and other urbanized areas of the City; the development of accessory dwelling units (ADUs) throughout the City; and projects that have either been approved or were in the entitlement process. Figure 3-4, *Housing Element Sites Inventory*, shows the location of sites identified for future residential development by the 2021-2029 Housing Element.

FIGURE 3-4: HOUSING ELEMENT SITES INVENTORY



Source: City of Glendora, *City of Glendora 2021-2029 Housing Element*, 2021.

The Route 66 Corridor Specific Plan establishes a comprehensive policy and regulatory guidance document for all properties within the Route 66 Corridor specific plan project area. The plan area contains approximately 287.18 acres, generally located along Route 66 from Barranca Avenue on the west to Amelia Avenue on the east. The Specific Plan was adopted in December 2003 and was revised in May 2017. The Specific Plan provides the necessary regulatory and design guidance that will ensure future development implements the adopted policy for the project area. The Route 66 Corridor Specific Plan is a community-based plan, developed with extensive input by policy makers, business owners and property owners. The policy and regulatory elements of the specific plan are reflective of public consultation with business and property owners, developers, appointed and elected officials, staff, and the public.

The Arrow Highway Specific Plan, adopted in 2018, outlines a long-term vision and goals for a 2.73-mile stretch of Arrow Highway. The plan aims to revitalize the corridor through a mix of redevelopment initiatives, including neighborhood-serving retail, office spaces, light industrial uses, a variety of housing options, as well as bike paths and open spaces. It also introduces new land use designations and development standards for both residential and commercial properties.

GLENDORA METRO STATION AND FOOTHILL EXTENSION

The Foothill Extension (formerly the Gold Line Foothill Extension) is an ongoing construction project extending the light rail A Line (formerly Gold Line), a part of the Los Angeles County Metropolitan Transportation Authority (Metro) public transit system. The Glendora Metro Station is located just south of the City's historic downtown, east of Vermont Avenue and west of Glendora Avenue. The center platform station has light rail tracks on either side (one for westbound and one for eastbound trains).[3] Once the project is completed, a trip from Glendora to Pasadena will take approximately 22 minutes and further to downtown Los Angeles will take approximately 51 minutes. Major project construction was completed in January 2025; the extension is undergoing final testing, training, and preparation and is anticipated to open for passenger service in summer 2025.[4]

3.7 INFRASTRUCTURE SYSTEMS

Infrastructure systems within the City, such as roadways, water and wastewater facilities, electricity, and natural gas, provide vital community and individual functions. Local transportation and water and wastewater conveyance facilities and distribution systems are maintained and operated by the City. Electricity, natural gas, and regional wastewater conveyance and treatment facilities are primarily owned, operated, and maintained by other agencies. The ability for

[3] Metro Gold Line Foothill Extension Construction Authority, *Glendora*, https://foothillgoldline.org/cities_stations/glendora/, accessed September 9, 2024.

[4] Metro Gold Line Foothill Extension Construction Authority, *Foothill Gold Line News,* https://foothillgoldline.org/dual_content/sign-up-for-e-news/, accessed February 25, 2025.

infrastructure systems to remain operational during hazard events and emergencies will contribute to the City's ability to withstand or recover sooner from hazard events.

TRANSPORTATION

Regional access is provided via the Foothill Freeway (I-210). The I-210 Freeway provides east-west regional circulation through the City, connecting with the Orange Freeway (SR-57) at the eastern boundary of the City. There are three roadways that interchange with the I-210 Freeway: Grand Avenue, Sunflower Avenue, and Lone Hill Avenue. Inspection and maintenance of the City's transportation facilities are critical to ensuring their protection against disasters, such as earthquakes.

Public transportation in the City is provided through a combination of regional transit systems and various city contracted bus systems. The Los Angeles County Metropolitan Authority (Metro) provides bus service, connecting the City to the larger San Gabriel region. Light rail service will be provided to the City with the future extension of the A Line (Gold Line). The Glendora to Pomona Foothill Extension segment was completed in January 2025 and is anticipated to begin operation in summer 2025. In addition to the public transit options, the City offers a Dial-Ride-Service, which is a shared ride, curb-to-curb, transportation service provided to Glendora Residents who are 62 years of age or older, as well as residents who are younger than 62 who are unable to independently use the public transportation system due to disability.

WATER AND WASTEWATER

The City of Glendora Public Works Department, Water Division (GWD) provides potable water service to the majority of the City's residents and businesses. A small portion of the City is served by Suburban Water Systems and the City of Azusa Light & Water Department. According to the City of Glendora 2020 Urban Water Management Plan (UWMP), the City is classified as an urban water supplier because it serves more than 3,000 customers. The City's main source of water supply is groundwater pumped from the Main San Gabriel Valley Basin. Additional water sources include the filtered surface water from the Metropolitan Water District of Southern California (MWD), and filtered surface water from the Covina Irrigating Company (CIC). According to GWD, potable water is disinfected with chlorine (CIC and groundwater) or chloramines (MWD) before it is delivered to residents and businesses. MWD imported water sources are a blend of State Water Project water from northern California and water from the Colorado River Aqueduct. CIC source water originates from the San Gabriel Mountains.

The wastewater generated in the City of Glendora is treated by the Sanitation Districts of Los Angeles County (LACSD). According to the UWMP, wastewater is tied through the City's local sewer collection system. The City's local sewers connect into LACSD's regional trunk sewers. The regional trunk sewer lines deliver wastewater to one or more water reclamation plants owned by LACSD for treatment. The water reclamation plants are not located in the City's service area.

The water reclamation plants serving the City include the San Jose Creek Water Reclamation Plant (SJCWRP) and the Joint Water Pollution Control Plant (JWPCP). The SJCWRP has a treatment capacity of about 100 MGD. According to LACSD, the JWPCP treats 260 million gallons of wastewater per day (mgd) and has a total permitted capacity of 400 mgd.

ELECTRICITY

Southern California Edison (SCE) provides electricity to the City of Glendora. Electricity is distributed from power plants through power lines and substations. There are underground and overhead powerlines within the City. Damage to a substation or the larger distribution system outside of the City could result in power loss to the City. More localized power losses can also occur in the event transmission lines are damaged.

NATURAL GAS

Southern California Gas (SoCalGas) provides gas service to the City of Glendora. According to SoCalGas Gas Transmission Pipeline map of Los Angeles County, there is a high-pressure distribution line that runs along South Glendora Avenue to Route 66 within the City. Other gas transmission pipelines and high pressure (greater than 60 pounds per square inch) gas distribution mains run through other areas of Los Angeles County. Damage to these facilities could interfere with the natural gas service in the City. Similarly, more localized disruptions could occur in the event lower pressure distribution mains and smaller service lines connected to the gas meters at homes and businesses are damaged.

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Section 4.0 | Risk and Vulnerability Assessment

4.1 HAZARD IDENTIFICATION

This section outlines the natural hazards that may impact Glendora, detailing their identification, classification, and the considerations used to assess their potential risk to the community. FEMA identifies a wide range of natural hazards that could affect communities, though their list is not exhaustive and allows for the inclusion of additional hazards based on local context. While Glendora may not be susceptible to all of these hazards, the Planning Team utilized various resources—including the City's 2015 Natural Hazards Mitigation Plan, the Glendora General Plan Safety Element, the County of Los Angeles General Plan 2035 Safety Element, the California State Hazard Mitigation Plan (SHMP), and FEMA's hazard list—to evaluate the risks specific to the area. The discussion of each hazard was informed by past occurrences in the City and surrounding areas, along with input from the community through surveys, outreach events, and focused meetings. Professional expertise and knowledge also played a key role in identifying and analyzing hazards.

Table 4-1, *Glendora Hazard Identification*, summarizes the hazards considered for inclusion in the Local Hazard Mitigation Plan (LHMP), incorporating findings from FEMA's National Risk Index to further assess the City's exposure to each identified hazard. In the process, the Planning Team consolidated some hazards into broader categories, renamed others for clarity, and added new hazards. For example, fault rupture, seismic ground shaking, liquefaction, and seismic-induced landslides are now grouped under the broader category of Seismic and Geologic Hazards. Severe Weather encompasses Santa Ana winds, heavy rain events (including those during El Niño years), and extreme heat, with extreme heat being newly included. Dam/Reservoir Failure now includes the potential for reservoir failures, and mudflows are categorized under non-seismic induced landslides. Drought has also been added as a new hazard to the profile.

Climate change, while not considered a separate hazard, is recognized as a factor that may intensify existing hazards. The Planning Team decided to address climate change within the profiles of specific hazards it may exacerbate. Additionally, power outages—whether planned or unplanned—are a secondary concern linked to multiple hazards. These outages are discussed in detail within the Severe Weather profile and cross-referenced in other relevant hazard profiles.

TABLE 4-1: GLENDORA HAZARD IDENTIFICATION

Hazards	Include in City LHMP?	Discussion of Hazard's Inclusion or Exclusion
Avalanche	No	Avalanches are not applicable to Glendora.
Climate Change*	Yes	Climate change is not a discrete hazard but may change the characteristics of a hazard that affects the community, such as frequency and intensity. Climate change is discussed within each of the applicable hazard profiles.
Coastal Flooding	No	Not applicable due to distance from the coast.
Cold Wave	No	Not applicable due to climatic conditions.
Dam/Reservoir Failure*	Yes	Dams and reservoirs occur within and around the City and their potential failure could impact the City.
Drought	Yes	The City depends on groundwater and imported surface water, both of which are susceptible to drought.
Earthquake	Yes	The City is underlain by the Sierra Madre Fault Zone. Hazards associated with earthquakes are addressed within the hazard category Seismic and Geologic Hazards.
Hail/Ice Storm	No	The City does not typically experience significant hail or ice storms.
Heat Wave (Extreme Heat)	Yes	Although extreme heat conditions are not typical within Glendora, they are becoming more common and typically have a greater impact on vulnerable populations. Extreme heat is addressed within the hazard category Severe Weather.
Landslide	Yes	Portions of the City are located within areas identified as having a potential to experience seismic-induced landslides. Additionally, due to the topography of the City, there is the potential for slope instability and mudflows. These topics are addressed within the hazard category Seismic and Geologic Hazards.
Lightning	No	The City does not typically experience significant lightning events resulting in damage.
Flood (Riverine Flooding)	Yes	FEMA-identified floodplains are located within the City and are therefore included.
Geological Hazards*	Yes	Geological hazards that occur within the City are primarily associated with landslides, mudflows, and slope instability. These are addressed under the hazard category Seismic and Geologic Hazards.
Hazardous Materials*	No	Hazardous materials are not generated within the City. Potential impacts associated with hazardous materials are more likely associated with a hazardous material spill along major transportation routes, which are addressed at the regional level and within the City's Emergency Operations Plan.
Hurricane	No	Hurricanes do not occur within the City.
Liquefaction*	Yes	Portions of the City are located within areas identified as having the potential for liquefaction. Liquefaction is addressed within the hazard category Seismic and Geologic Hazards.
Seismic Hazards*	Yes	The City is located within an area of southern California susceptible to earthquake ground shaking and associated seismic hazards, including liquefaction. These topics are addressed within the hazard category Seismic and Geologic Hazards.

Hazards	Include in City LHMP?	Discussion of Hazard's Inclusion or Exclusion
Strong Wind	Yes	The City experiences periods of high wind events associated with Santa Ana wind conditions. Within the LHMP, these events are addressed under the hazard category Severe Weather.
Tornado	No	Tornadoes do not occur within the City.
Tsunami	No	Not applicable due to distance from the coast.
Volcanic Activity	No	The City is not located within an active volcano area.
Wildfire	Yes	The City contains areas identified as fire hazards. Wildfire is profiled within the LHMP.
Winter Weather	Yes	The City does not typically experience severe winter storm events. However, Glendora does experience heavy rain events with extended durations. Within the LHMP, heavy rains events are addressed under the hazard category Severe Weather.

Source: City of Glendora, 2024; FEMA National Risk Index.

Note: * indicates a hazard that is not included in FEMA's National Risk Index but is locally relevant.

The following hazards are discussed within the LHMP:

- Climate Change (integrated into each hazard)
- Dam/Reservoir Failure
- Drought
- Flood
- Seismic and Geologic Hazards (ground shaking, liquefaction, landslides, mudflows, slope instability)
- Severe Weather (heavy rains, Santa Ana wind events, extreme heat)
- Wildfire

4.2 HAZARD PROFILES

This section contains profiles for the hazards identified as having the potential to occur in Glendora. Each hazard includes a description of the hazard, location of where the hazard may occur, history of the hazard, and the probability of the hazard's future occurrence.

The probability of future occurrences are based on historical frequencies, statistical probabilities, hazard probability maps, and other available information. Probabilities are defined as follows:

- Unlikely – There may or may not have been historic occurrences of the hazard in the community or region and data suggest that occurrences are unlikely. The chance of future occurrences is less than 1 percent each year.
- Occasional – There may or may not have been historic occurrences of the hazard in the community or region, but data suggest there is a possibility that the hazard will occur in the community. The chance of future occurrences is between 1 to 10 percent each year.
- Likely – There has been historic occurrences of the hazard in the community or region and data suggest it is likely that the hazard will continue to occur in the community. The chance of future occurrences is between 10 to 90 percent each year.
- Highly likely – There has been historic occurrences of the hazard in the community or region and data suggest it is highly likely to continue to occur in the community. The chance of future occurrences is 90 percent or above each year.

DAM/RESERVOIR FAILURE

Description

A dam is an artificial barrier preventing the flow of water or loose solid materials (such as soil or snow) or a barrier built across a watercourse for impounding water. Dam failure is the uncontrolled release of impounded water from behind a dam. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, and terrorism can all cause a dam to fail. Dam failure causes downstream flooding that can affect life and property.

Reservoirs are defined as an artificial lake, pond, impoundment or tank, used to store water. Reservoirs can be created on the surface by constructing dams to store water. Additionally, tank reservoirs can be constructed to store water either above ground, on the surface, or below ground. Reservoir failure is the uncontrolled release of impounded water from a reservoir. Similar to dams, flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, and terrorism activities can all cause a reservoir to fail. Seismic activity may also cause inundation by the action of a differential movement of a reservoir and the water within, causing shearing or buckling of the reservoir infrastructure.

Dam or reservoir failures are most likely to happen for the following reasons:[1]

- Overtopping, caused by water spilling over the top of a dam; usually a precursor of dam failure because of inadequate spillway design, debris blockage of spillways, or settlement of the dam crest.
- Foundation defects, including settlement and slope instability.
- Cracking caused by natural settling of a dam or seismic movements.
- Inadequate maintenance and upkeep.
- Piping, when seepage through a dam is not properly filtered, soil particles continue to progress and form sinkholes in the dam.

FEMA and Cal OES require all dam owners to develop an Emergency Action Plan (EAP) for warning, evacuation, and post-flood actions. In the event of a major dam failure, mutual aid from all levels of government would be required for an extended period. Recovery efforts would include the removal of debris, clearing roadways, demolishing unsafe structures, assistance in reestablishing public services, and providing continued care for the affected population.

Dams are regulated by the Department of Water Resources, Division of Safety of Dams (DSOD). DSOD ensures dam safety by:[2]

- Reviewing and approving dam enlargements, repairs, alterations, and removals, and ensuring that the dam appurtenant structures are designed to meet minimum requirements.
- Performing independent analyses to understand dam and appurtenant structures performance, including structural, hydrologic, hydraulic, and geotechnical evaluations.
- Overseeing construction to ensure work is performed in accordance with approved plans and specifications.
- Inspecting each dam on an annual basis to ensure it is safe, performing as intended, and not development issues.
- Periodically reviewing the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California.

[1] Association of State Dam Safety Officials, *Dam Incident Database Search*, https://damsafety.org/Incidents, accessed July 19, 2023.
[2] California Department of Water Resources, *Division of Safety of Dams*, https://water.ca.gov/programs/all-programs/division-of-safety-of-dams, accessed June 4, 2024.

DSOD is responsible for assigning each jurisdictional dam a downstream hazard potential. The downstream hazard potential is based on potential downstream impacts to life and property should the dam fail when operating with a full reservoir. The downstream hazard is not related to the condition of the dam or the likelihood of the dam failing in either the short- or long-term. Dams in southern California usually do not operate at full capacity at all times of the year, and thus hazard risks and classifications are a worst-case scenario assessment. The DSOD definitions for downstream hazards are borrowed from the Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures. FEMA categorizes the downstream hazard potential into three categories – low, significant, and high – DSOD adds a fourth category of extremely high:[3]

- Low: No probable loss of human life and low economic and environmental losses. Losses are expected to be principally limited to the owner's property.
- Significant: No probable loss of human life but can cause economic loss, environmental damage, impacts to critical facilities, or other significant impacts.
- High: Expected to cause loss of at least one human life.
- Extremely High: Expected to cause considerable loss of human life or would result in an inundation area with a population of 1,000 or more.



Source: Kiewit, *Dams by Kiewit*, https://www.linkedin.com/posts/kiewit_dams-by-kiewit-activity-7034553427934265344-P1-Z, accessed November 21, 2024.

DSOD uses the U.S. Army Corps of Engineer's National Inventory of Dams condition assessment rating definition as a guideline in assigning condition assessments. A dam safety deficiency is defined as a load capacity limit or other issue that can result in a failure of the dam or appurtenant structure. It is a characteristic or condition that does not meet the applicable minimum regulatory criteria. Conditions assessment definitions are as follows:

Satisfactory	No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines. Typical Circumstances:

[3] California Department of Water Resources, Definitions for Downstream Hazard and Condition Assessment, https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-of-Safety-of-Dams/Files/Publications/Division-of-Safety-of-Dams-Definitions-for-Downstream-Hazard-and-Condition-Assessment.pdf, September 2021, accessed June 4, 2024.

- No existing deficiencies or potentially unsafe conditions are recognized, with the exception of minor operational and maintenance items that require attention.
- Safe performance is expected under all loading conditions including the design earthquake and design flood.
- Permanent risk reduction measures (reservoir restrictions, spillway modifications, operating procedures, etc.) have been implemented to eliminate identified deficiencies.

Fair	No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action. Note: Rare or extreme events are defined by the regulatory agency based on their minimum applicable state or federal criteria. Other Circumstances: ▪ Lack of maintenance requires attention to prevent developing safety concerns. ▪ Maintenance conditions may exist that require remedial action greater than routine work and/or secondary studies or investigations. ▪ Interim or permanent risk reduction measures may be under consideration.
Poor	A dam safety deficiency is recognized for normal operating conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Investigations and studies are necessary. Other Circumstances: ▪ Dam has multiple deficiencies or a significant deficiency that requires remedial work. ▪ Lack of maintenance (erosion, sinkholes, settlement, cracking, unwanted vegetation, animal burrows, inoperable outlet gates) has affected the integrity or the operation of the dam under normal operational conditions and requires remedial action to resolve. ▪ Critical design information is needed to evaluate the potential performance of the dam. For example, a field observation or a review of the dam's performance history has identified a question that can only be answered by review of the design and construction history for the dam. Uncertainty arises when there is no design and/or construction documentation available for review and additional analysis is needed to better understand the risk associated with operation under normal operational conditions. ▪ Interim or permanent risk reduction measures may be under consideration.
Unsatisfactory	A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

	Typical Circumstances: ▪ A critical component of the dam has deteriorated to unacceptable condition or failed. ▪ A safety inspection indicates major structural distress (excessive uncontrolled seepage, cracks, slides, sinkholes, severe deterioration, etc.), advanced deterioration, or operational deficiencies which could lead to failure of the dam or its appurtenant structures under normal operating conditions. ▪ Reservoir restrictions or other interim risk reduction measures are required. ▪ A partial or complete reservoir drawdown may be mandated by the state or federal regulatory agency.
Not Rated	The dam has not been inspected, is not under state jurisdiction, or has been inspected but, for whatever reason, has not been rated.

Location and Extent

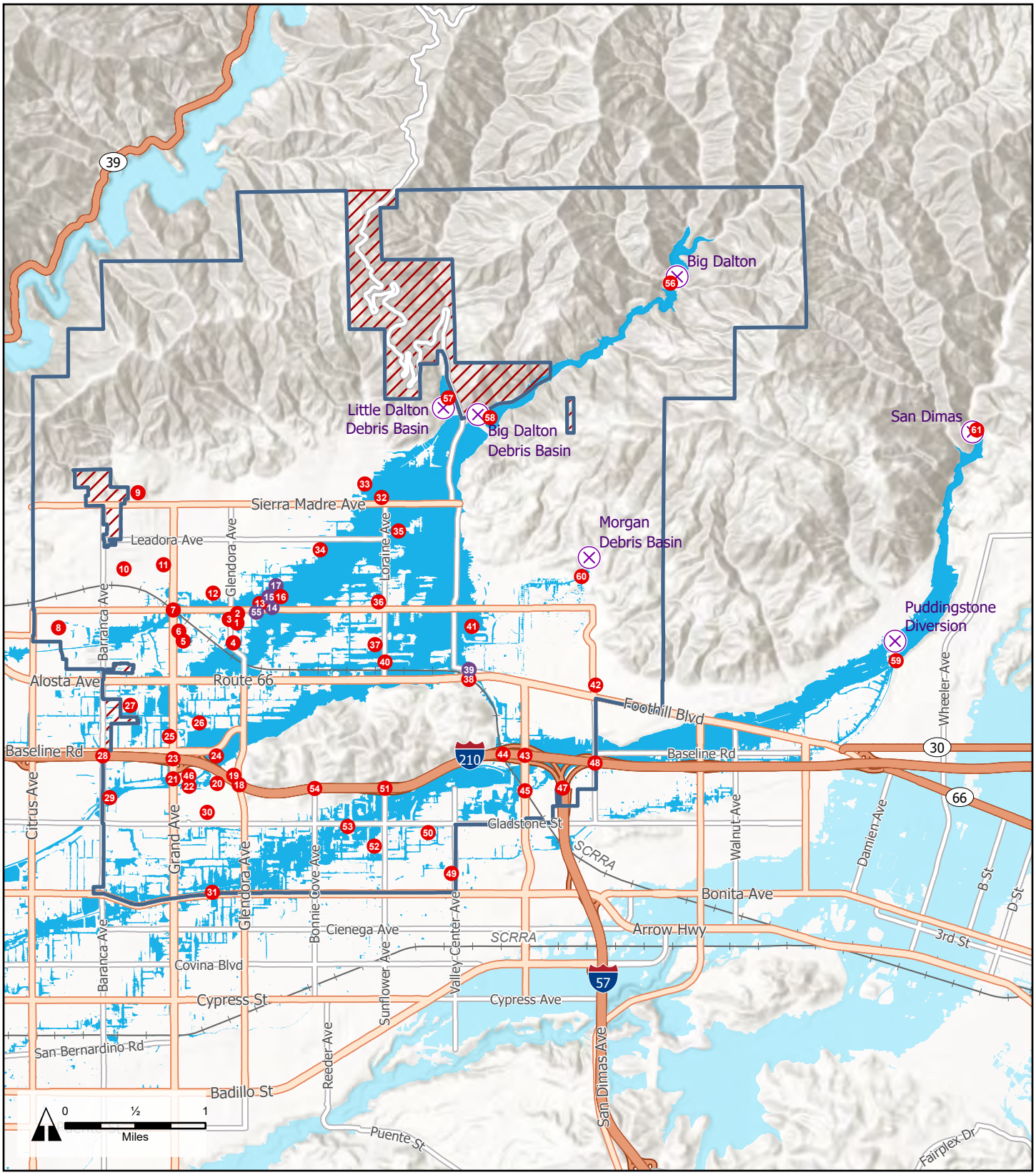
Critical dams and reservoirs with the potential to inundate parts of the City are identified in Table 4-2, *Dams With Inundation Areas Affecting Glendora* and shown on Figure 4-1, *Dams With Inundation Areas Affecting Glendora*. DSOD's downstream hazard potential and condition assessment for each dam and reservoir are also provided in Table 4-2.

TABLE 4-2: DAMS WITH INUNDATION AREAS AFFECTING GLENDORA

Name of Dam	Owner	Dam Purpose	Downstream Hazard Potential	Condition Assessment
Little Dalton Debris Basin	Los Angeles County Department of Public Works	Debris Control, Flood Risk Reduction	Extremely High	Satisfactory
Big Dalton Debris Basin	Los Angeles County Department of Public Works	Debris Control, Flood Risk Reduction	High	Satisfactory
Big Dalton	Los Angeles County Department of Public Works	Flood Risk Reduction, Water Supply	Extremely High	Satisfactory
Puddingstone Diversion	Los Angeles County Department of Public Works	Other, Flood Risk Reduction	High	Satisfactory
Morgan Debris Basin	Los Angeles County Department of Public Works	Debris Control	High	Satisfactory
San Dimas	Los Angeles County Department of Public Works	Flood Risk Reduction, Irrigation, Water Supply	Extremely High	Satisfactory

Source: Department of Water Resources, Division of Safety of Dams, *Dams Within Jurisdiction of the State of California, Dams Listed Alphabetically by Dam Name*, September 2023; National Inventory of Dams, *Dams of the Nation*, https://nid.sec.usace.army.mil/#/, accessed June 4, 2024.

The geographic extent of dam or reservoir failure is dependent on the type of infrastructure and amount of water stored at the time of the hazard incident. Development of maps that show inundation areas in the event of dam failure is the responsibility of the dam's owner. Inundation maps have been prepared as part of the EAP effort through DSOD and Cal OES. As shown in Figure 4-1, inundation areas occur within a significant portion of the central and southern areas of the City, trending in a southwesterly direction, generally between Little Dalton Wash and Big Dalton Wash, and along San Dimas Wash. Inundation areas include, but are not limited to, residential and commercial uses. A total of 2,168.4 acres within the City and Sphere of Influence (SOI) are located within inundation areas.



LEGEND

- Critical Facility
- Facility of Concern
- City of Glendora
- Sphere of Influence
- Dam with Inundation Area Affecting Glendora
- Dam Failure Inundation Areas affecting Glendora
- Nearby Dam Failure Inundation Areas

CITY OF GLENDORA, CALIFORNIA

Figure 4-1. Dams with Inundation Areas Affecting Glendora

Sources: California Department of Water Resources, Division of Dam Safety; Los Angeles County GIS. Map date: December 12, 2024.

Previous Occurrences

The City of Glendora has not experienced a dam or reservoir failure. Since the 20th century, there have been a total of seven dam incidences deemed as failures in California. Of these, six have been in southern California; refer to Table 4-3, *Dam Failures in Southern California*. The most recent dam failure occurred in the San Fernando Valley area of Los Angeles County in 1971.

TABLE 4-3: DAM FAILURES IN SOUTHERN CALIFORNIA

Name of Dam	City/Region	County	Year	Reason for Failure
Lower Otay	Chula Vista	San Diego	1916	Heavy flooding, overtopped; 30 fatalities
Sweetwater	Bonita	San Diego	1916	Heavy flooding, overtopped; 30 fatalities
Sheffield	Santa Barbara	Santa Barbara	1925	Earthquake-induced slide
Saint Francis	San Francisquito Canyon	Los Angeles County	1928	Sudden failure at full capacity due to poor construction; 450 fatalities
Baldwin Hills	Los Angeles	Los Angeles County	1963	Leak through embankment turned into washout; 5 fatalities
San Fernando/ Van Norman	San Fernando/ Granada Hills	Los Angeles County	1971	Earthquake-induced slide; failed due to poor construction

Source: Association of State Dam Safety Officials, *Dam Incident Database Search*, https://damsafety.org/incidents, accessed June 5, 2024.

Probability of Future Occurrences

The primary hazards that could cause failure of the reservoirs and their associated dams are strong earthquake ground shaking, seiche, and liquefaction. Seiches are changes or oscillations of water levels within a confined water body caused by fluctuation in the atmosphere, tidal currents, or earthquakes. All the sites listed in Table 4.1 would be subject to seismic ground shaking, as is the entire southern California region, due to the presence of numerous major faults; refer to the Seismic and Geologic Hazards Profile for more information. In addition, portions of the Little Dalton Debris Basin, Big Dalton Debris Basin, and Puddingstone Diversion are within a mapped liquefaction zone; portions of the Big Dalton, Morgan Debris Basin, and San Dimas are within a mapped landslide zone; and the Big Dalton Debris Basin is underlain by the Sierra Madre fault zone. There have been no dam or reservoir failures near the City and no recent failures within Los Angeles County. Over the years, the State of California has implemented stringent standards, regulations, and regular inspections of dam facilities, including after the Oroville Dam crisis in 2017, requiring additional inundation mapping and emergency preparedness planning. Additionally, as shown in Table 4-2, all dams with the potential to inundate parts of Glendora have received a condition assessment rating of “satisfactory” by the DSOD. Therefore, the probability of future occurrences of reservoir or dam failure is considered to be unlikely.

Climate Change Considerations

Dam/reservoir failure is not directly correlated to climate change. Dam and reservoir failure could be caused by seismic activity, which is also not caused by climate change. However, ground failure (due to oversaturated soils) compromising infrastructure integrity or heavy rains overtopping dams could occur. Repetitive severe storm events could increase “wear and tear”

and require additional maintenance and infrastructure improvements to protect dam and reservoir integrity and function. Largely, dam and reservoir operations occur outside of climate change and are not directly impacted by climate change conditions.

DROUGHT

Description

Drought in its simplest definition is an extremely dry climatic period where the available water falls below a statistical average for a region. Drought is also defined by factors other than rainfall, including vegetation conditions, agricultural productivity, soil moisture, water levels in reservoirs, and stream flow. Droughts or water shortages are a gradual phenomenon, occurring over multiyear periods and increasing with the length of dry conditions. When precipitation is less than normal for a period, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells increases. If dry weather persists and water supply problems develop, the dry period can become a drought. Drought cycles are common in southern California and are influenced by cyclical El Niño and La Niña events.

El Niño and La Niña are opposing weather phenomena that significantly impact global climate patterns.[4] El Niño occurs when Pacific trade winds weaken, causing warm ocean water to move eastward toward the Americas. This shift in water temperature alters atmospheric circulation, resulting in wetter conditions and increased flooding in the southern U.S. La Niña, the opposite of El Niño, occurs when trade winds strengthen, pushing more warm water toward Asia and increasing upwelling along the west coast of the Americas. This results in drier conditions in the southern U.S., often resulting in droughts.

The term “drought” can have different meanings depending on how a water deficiency affects day to day activities. Drought is a complex natural hazard, which is reflected in the following four definitions commonly used to describe it:[5]

- Agricultural – Agricultural drought is based on the impacts to agriculture by factors such as rainfall deficits, soil water deficits, reduced groundwater, or reservoir levels needed for irrigation.
- Hydrological – Hydrological drought is based on the impact of rainfall deficits on the water supply such as stream flow, reservoir and lake levels, and ground water table decline.
- Meteorological – Meteorological drought is based on the degree of dryness or rainfall deficit and the length of the dry period.

[4] National Oceanic and Atmospheric Administration, *What are El Niño and La Niña?*, https://oceanservice.noaa.gov/facts/ninonina.html, accessed June 10, 2024.
[5] National Oceanic and Atmospheric Administration, *Understanding Drought and How to Respond*, https://www.weather.gov/safety/drought, accessed June 5, 2024.

- Socioeconomic – Socioeconomic drought is based on the impact of drought conditions (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related deficit in water supply.

Although climate is a primary contributor to hydrological drought, other factors such as changes in land use (i.e., deforestation), land degradation, and the construction of dams all affect the hydrological characteristics of a region. Since regions are interconnected by natural systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area. Changes in land use upstream may alter hydrologic characteristics such as infiltration and runoff rates, resulting in more variable stream flow and a higher incidence of hydrologic drought downstream. Land use change is one way human actions alter the frequency of water shortage even when no change in precipitation has been observed.

Droughts cause public health and safety impacts, as well as economic and environmental impacts. Public health and safety impacts are primarily associated with catastrophic wildfire risks and drinking water shortage risks for small water systems in rural areas and private residential wells. Examples of other impacts include costs to homeowners due to loss of residential landscaping, degradation of urban environments due to loss of landscaping, agricultural land fallowing and associated job loss, degradation of fishery habitat, and tree mortality with damage to forest ecosystems. Drought conditions can also result in damage to older infrastructure that is located within dry soils with potential to leak or break. Dead or dying vegetation poses a risk to falling and damaging structures and infrastructure systems.

In Los Angeles County, drought conditions typically result in implementation of large-scale conservation efforts, reducing water supplies to customers and altering the pricing system by implementing higher rates for water usage that exceeds certain levels (i.e., wasteful). Higher rates that may be imposed during a drought could have disproportionate impacts on lower-income households. Reduction in groundwater supplies during drought conditions can also result in the need for water agencies that have high reliance on local groundwater supplies to purchase larger amounts of imported water. Drought conditions have also resulted in drier brush and an increase in the size and severity of wildfires; refer to the Wildfire Hazard Profile for further discussion.

Location and Extent

Droughts are generally widespread events that could easily affect the entire City of Glendora, and the larger Los Angeles County region. The geographic extent of drought conditions could extend to every resident and business owner receiving water from the City of Glendora Water Division, Suburban Water Systems, and the City of Azusa Light & Water Department, the water suppliers for the City. These three water suppliers rely on imported water from other regions (e.g., Colorado River and Northern California) via aqueducts. As a result, droughts can be caused or made worse by conditions in the regions in which the water originates.

Drought severity depends on numerous factors, including duration, intensity, geographic extent, as well as regional water supply demands by humans and vegetation. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity. The magnitude of drought is usually measured in time and the severity of the hydrologic deficit.

The U.S. Drought Monitor is a map released weekly that indicates the portions of the United States that are experiencing drought and the severity of the drought based on five classifications: abnormally dry (D0), showing areas that may be going into or are coming out of drought, and four levels of drought: moderate (D1), severe (D2), extreme (D3), and exceptional (D4); refer to Table 4-4, *Drought Severity Classification*.

TABLE 4-4: DROUGHT SEVERITY CLASSIFICATION

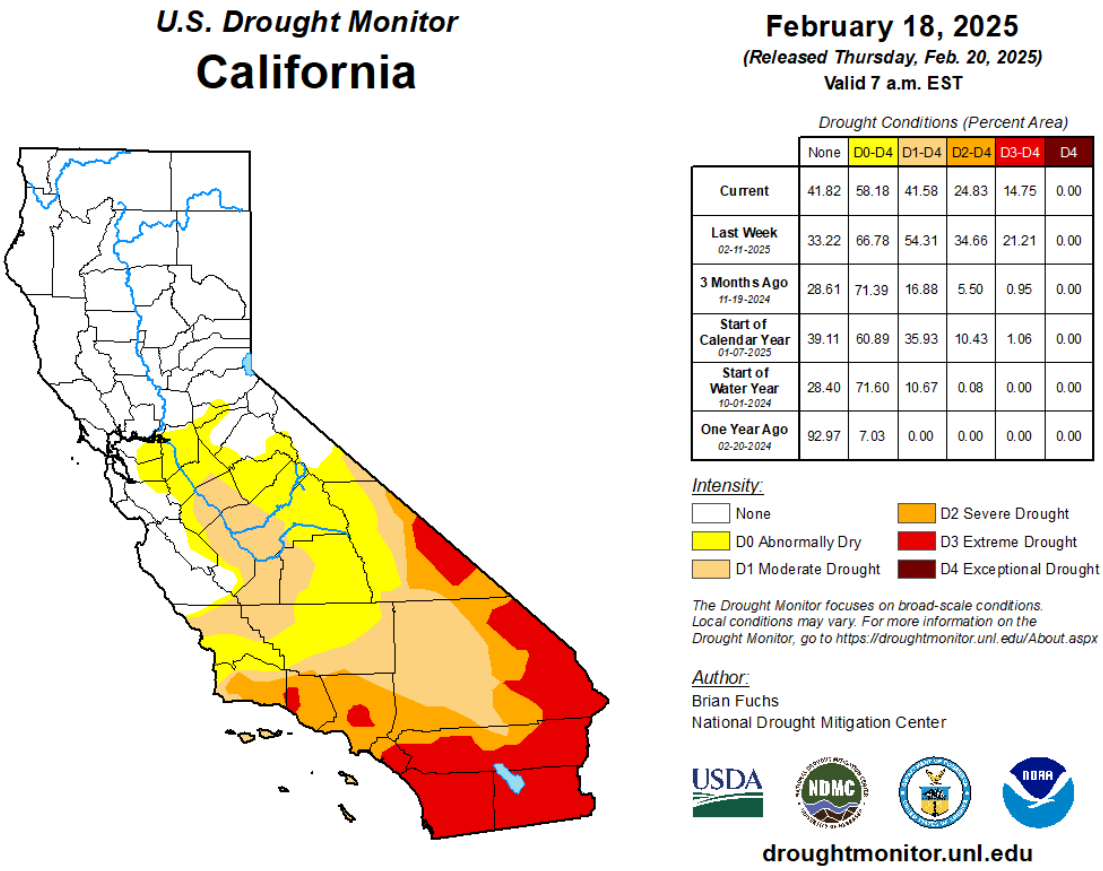
Category	Description	Possible Impacts
D0	Abnormally Dry	Active fire season begins; dryland crop germination is stunted; soil is dry; snowpack is minimal.
D1	Moderate Drought	Dryland pasture growth is stunted; landscaping and gardens need irrigation earlier; wildlife patterns begin to change; stock ponds and creeks are lower than usual. .
D2	Severe Drought	Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent; river flows decrease; reservoir levels are low, and banks are exposed.
D3	Extreme Drought	Fire season lasts year-round; water conservation rebate programs increase; water use restrictions are implemented.
D4	Exceptional Drought	Water shortages are widespread; surface water is depleted; poor air quality affects health; fields are left fallow.

Source: U.S. Drought Monitor, *Drought Classification*, https://www.droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx, accessed June 3, 2024; U.S. Drought Monitor, *California*, https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CA, accessed June 3, 2024.

The Drought Monitor is not a forecast but looks backward, providing a weekly assessment of drought conditions based on how much precipitation did or did not fall. Because drought is a slow-moving hazard, it may take more than one good rainfall to end a drought, especially if an area has been in drought for a long time.

Figure 4-2, *Drought Monitor Map*, depicts the drought monitor map, which identifies areas of drought and labels them by intensity as shown in Table 4-3. As of February 18, 2025, Los Angeles County is classified as D1, D2, and D3 by the U.S. Drought Monitor, meaning parts of the County are currently experiencing moderate-to-extreme drought conditions. Glendora is identified as D2, meaning it is experiencing severe drought conditions.

FIGURE 4-2: DROUGHT MONITOR MAP



Source: United States Drought Monitor, *California*, https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CA, accessed February 25, 2025.

Previous Occurrences

Although defining drought can be challenging across a large geography, California has experienced numerous severe droughts over the past century. FEMA declared one drought emergency for California in January 1977, and other drought emergency declarations have been declared by the State. According to the 2023 State Hazard Mitigation Plan, from 1950 to 2022, there were 11 drought State Emergency Proclamations in California.[6]

Table 4-5, *Historical Droughts*, shows the historical droughts that have occurred in California from 1827 through the present.

[6] California Governor's Office of Emergency Services, *2023 California State Hazard Mitigation Plan*, https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/2023-California-SHMP_Volume-1_11.10.2023.pdf, published August 2023, accessed June 4, 2024.

TABLE 4-5: HISTORICAL DROUGHTS

Date	Area Affected	Notes
1827-1916	Statewide	Multiyear: 1827–29, 1843–44, 1856–57, 1863–64 (particularly extreme), 1887–88, 1897–1900, 1912–13.
1917-21	Statewide except central Sierra Nevada and north coast	Simultaneous in affected areas, 1919–20. Most extreme in north.
1922–26	Statewide except central Sierra Nevada	Simultaneous in effect for entire State only during 1924, which was particularly severe.
1928-37	Statewide	Simultaneously in effect for the entire State, 1929–34. Longest, most severe in State's history.
1943–51	Statewide	Simultaneously in effect for entire State, 1947–49. Most extreme in south.
1959–62	Statewide	Most extreme in Sierra Nevada and central coast.
1976–77	Statewide, except for southwestern deserts	Driest 2 years in State's history. Most severe in northern two-thirds of State.
1987–92	Statewide	Moderate, continuing through 1989. Most extreme in northern Sierra Nevada.
2000-2002	Statewide	Most severe in southern California.
2007-2009	Statewide	Twelfth driest 3-year period on record at the time. Most severe in western San Joaquin Valley.
2012-17	Statewide	Most severe California drought on record.
2021-23	Statewide	Drought emergency proclamation issued in April 2021 with additional orders May 2021, July 2021, October 2021, and October 2022. Drought restrictions eased in March 2023.

Source: Paulson, Chase, Roberts, and Moody, *National Water Summary 1988-89-- Hydrologic Events and Floods and Droughts*, 1991; California Department of Water Resources, *California's Most Significant Droughts: Comparing Historical and Recent Conditions*, February 2015; California Governor's Office of Emergency Services, *2023 California State Hazard Mitigation Plan*, August 2023.

The most severe drought on record began in 2012 and continued through 2016. On January 17, 2014, the governor of California declared a State drought emergency, and on April 1, 2014 the governor announced the first-ever mandatory 25 percent statewide water use reduction and a series of actions to help save water, increase enforcement to prevent wasteful water use, streamline the State's drought response, and invest in new technologies that would make California more drought resilient. At the time of the announcement, the volume of snowpack in California's mountains was approximately 14 percent of normal. Despite multiple storms in February 2014, drought conditions persisted. By the end of May 2014, all of California was in a condition of "extreme" or "exceptional" drought. At the same time, the volume of snowpack had decreased to less than 10 percent of normal and water stored in Statewide Reservoirs was at 56 percent of normal.[7] On April 7, 2017, the governor issued an executive order ending the drought emergency in Southern California, including Los Angeles County.

On October 19, 2021, the governor of California declared a State drought emergency, which added the eight counties, including Los Angeles County (not included within an executive order

[7] California Department of Water Resources, *California's Most Significant Droughts: Comparing Historical and Recent Conditions*, February 2015.

in April, May, or July 2021) calling for a voluntary reduction of water use by 15 percent across California.[8] This declaration followed the second driest year on record and near record low storage in California's largest reservoirs. The proclamation required local water suppliers to implement water shortage contingency plans responsive to local conditions and prepare for the possibility of a third dry year. On March 28, 2022, the governor issued an executive order noting continued drought conditions and requiring urban water suppliers to activate, at a minimum, Level 2 of their customized Water Shortage Contingency Plans. These plans, required by State law, are developed by local water agencies to navigate drought and each plan is customized based on an agency's unique infrastructure and management. Triggering Level 2 of these plans involves implementing water conservation actions to prepare for a water shortage level of up to 20 percent. For example, in many communities, this would mean reducing the number of days that residents can water outdoors, among other measures. On March 24, 2023, the governor rolled back some drought emergency provisions that were no longer needed due to improving water conditions, while maintaining other measures that support regions and communities still facing water supply challenges, and that continue building up long-term water resilience.[9]

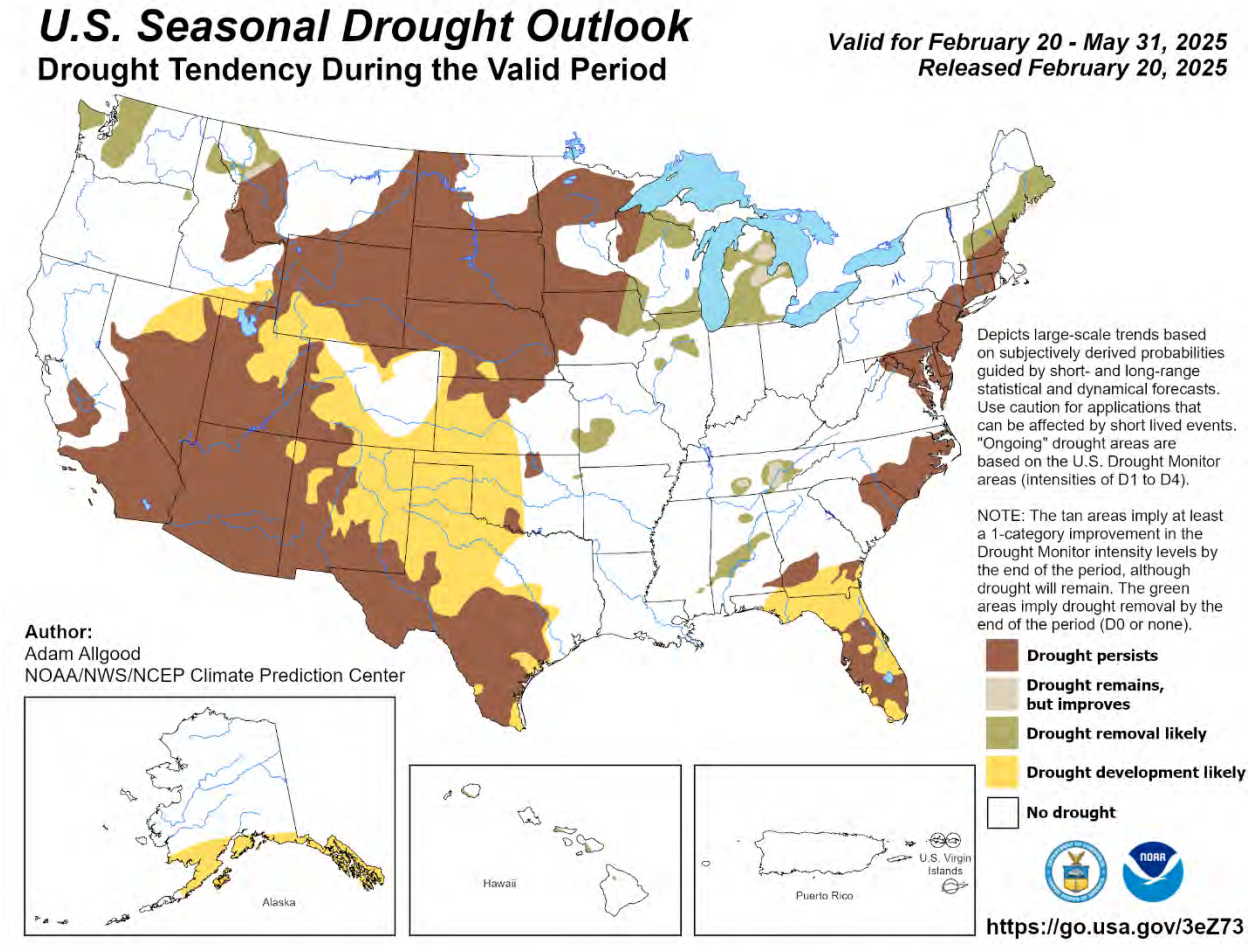
The City of Glendora Water Division provides water conservation programs and resources, including education programs, free water efficiency upgrades and rebates, water smart gardening workshops, water saving tips, and leak reporting.[10] During drought conditions, the City of Glendora Water Division educates residents and business owners regarding State-mandated water conservation measures. The City's Municipal Code (Chapter 14.34, *Water Conservation* and 21.03.060, *State Model Water Efficient Landscaping Ordinance Adopted by Reference*) includes water conservation and landscape water use standards, guidelines, and calculations to promote conservation and efficient use of water in the City.

Probability of Future Occurrences

Based on previous occurrences and trends in California, the likelihood that Glendora will experience drought conditions in the future is considered high. The U.S. Seasonal Drought Outlook depicts large-scale trends based on U.S. Drought Monitor areas (intensities of D1 to D4), as shown in Figure 4-3, *U.S. Seasonal Drought Outlook*. The coastal southern California region, including Glendora, is currently showing drought tendencies that are likely to persist. The probability of future occurrences is considered highly likely.

[8] California Governor's Office, *Proclamation of a State of Emergency*, October 2021.
[9] Governor Gavin Newsom, *Governor Newsom Eases Drought Restrictions*, https://www.gov.ca.gov/2023/03/24/governor-newsom-eases-drought-restrictions/, accessed June 5, 2024.
[10] City of Glendora, Water Conservation, https://www.cityofglendora.org/departments-services/public-works/water/water-conservation, accessed June 5, 2024.

FIGURE 4-3: U.S. SEASONAL DROUGHT OUTLOOK



Source: National Weather Service Climate Prediction Center, *U.S. Seasonal Drought Outlook*, https://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.png, accessed February 25, 2025.

Climate Change Considerations

Climate change can exacerbate droughts by making them more frequent, longer, and more severe. According to the 2023 State Hazard Mitigation Plan, there is a high probability of future drought events in the State, with at least one period of drought occurring somewhere in California every year. Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the twenty-first century due to climate change, such as more frequent and extended periods of high temperature conditions. Decreasing snowmelt, reduced precipitation, and higher temperatures are all expected effects of climate change. The *California Adaptation Planning Guide* states that the pressure climate change places on ground water reliance during times of drought is not sustainable. *California's Fourth Climate Change Assessment* states that California has experienced a succession of dry spells, and with warmer conditions the impacts of these droughts have increased. Additionally, recent droughts (2012-2016 and 2020-2022) have been followed by very wet winters, providing further indication of continued climate volatility. Increasing populations and increasing demand for water in southern

portions of California are anticipated to continue and may result in future challenges associated with drought conditions and climate change for Glendora and other communities.

Governor Brown's 2014 drought emergency declaration noted that droughts could occur more regularly into the future. Additionally, Governor Newsom's 2022 executive order notes that climate change continues to intensify the impacts of droughts. The experiences faced by water supply agencies during the recent and current droughts have prompted actions to examine water storage, distribution, management, conservation, and use policies more closely. Water districts drafted administrative drought actions and implemented mechanisms allowing for administrative consistency and coordination to address drought conditions statewide.

FLOOD

Description

Flooding occurs when a waterway, either a natural one or an artificial drainage channel, receives more water than it is capable of conveying, causing the water level in the waterway to rise. Depending on how long these conditions last and the amount of water the waterway receives in proportion to its capacity, the rising water level may eventually overtop the waterway's banks or any other boundaries to the drainage area, resulting in flooding in the surrounding area.

Floods often occur during heavy precipitation events, when the amount of rainwater exceeds the capacity of storm drains or flood control channels. Floods can also happen when infrastructure such as levees, dams, or culverts fail, or when a section of drainage infrastructure fails, and water cannot be drained from an area fast enough. These failures can be linked to precipitation events (i.e., when water erodes away a levee, allowing water to escape and flood nearby areas), or can be a consequence of other emergency situations (i.e., a dam collapsing due to an earthquake).

FEMA defines flood or flooding as a general and temporary condition of partial or complete inundation of normally dry land areas from:

- The overflow of inland or tidal waters;
- The unusual and rapid accumulation or runoff of surface waters from any source; or,
- Mudslides (i.e., mudflows) which are proximately caused by flooding and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

Floods can be caused by several factors, including:

- Weather and climate patterns (e.g., El Niño, La Niña, Pineapple Express, Atmospheric River, etc.)

  - El Niño and La Niña are complex weather patterns resulting from variations in ocean temperatures in the equatorial Pacific. Warmer or colder than average ocean temperatures in one part of the world can influence weather around the globe. El Niño and La Niña episodes typically last 9 to 12 months, but some prolonged events may last for years.[11]
  - Pineapple Express is a name given to an atmospheric river on the West Coast. It is a channel in the atmosphere that moves vast amounts of moisture and can result in massive showers.
- Hydrologic features such as reservoirs, ponds, lakes, rivers, etc. can have a large impact on the amount of flooding.
- The absorption capacity of the ground depends on the composition of soil and bedrock of the area. Less absorbent soil conditions in addition to lack of proper storm infrastructure can result in flooding.
- Type and density of vegetation is related to absorption of moisture affecting the flow of water.
- Patterns of land use/urbanization relates to the pervious and impervious nature of the ground.
- Expected level, age, and condition of flood management infrastructure will impact flooding conditions.
- Large-scale wildfires dramatically alter the terrain and ground conditions. Vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to absorb water, creating conditions ripe for flash flooding and mudflow. Flood risk remains significantly higher until vegetation is restored – up to five years after a wildfire.[12]

The force of a flood can be enough to carry away large objects and damage structures, causing considerable damage to buildings and infrastructure. In severe instances, floodwaters themselves can destroy structures or move them off their foundation. Floods can saturate and weaken soil, potentially making structures built on them more susceptible to damage or collapse. Flooding can affect water quality, as large volumes of water can transport contaminants into water bodies and overload storm and wastewater systems. Additionally, large increases in water volume can cause water body erosion and loss of aquatic habitat. It can also cause great economic loss to people and government due to the destruction of roads, bridges, farms, businesses, houses, and automobiles.

[11] National Oceanic and Atmospheric Administration, *What are El Niño and La Niña?*, https://oceanservice.noaa.gov/facts/ninonina.html, accessed June 10, 2024.
[12] Federal Emergency Management Agency, *Flood Risks Increase After Fires*, https://www.fema.gov/sites/default/files/documents/fema_flood-after-fire_factsheet_nov20.pdf, accessed June 4, 2024.

Location and Extent

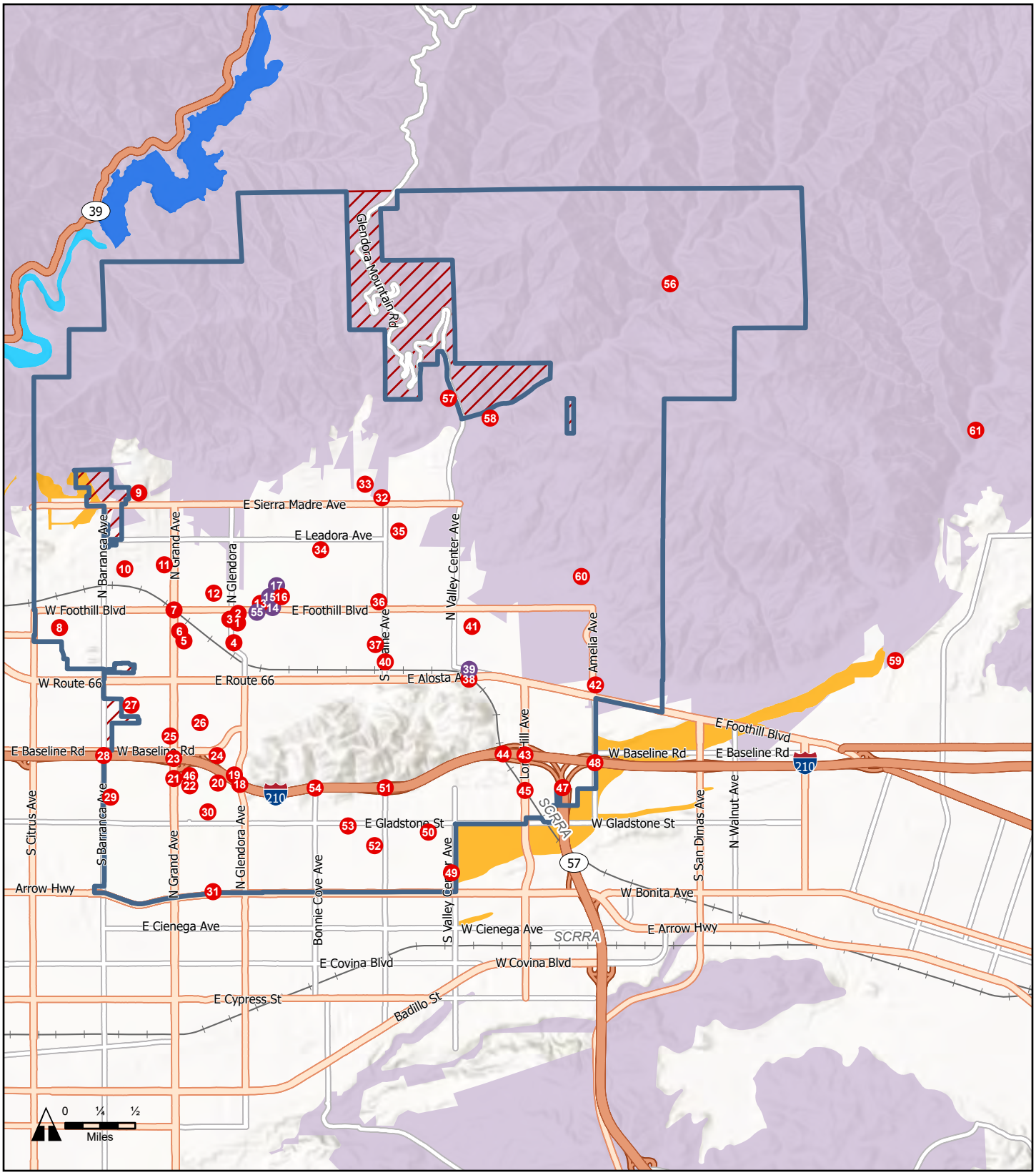
The City is adjacent to the San Gabriel Mountains and located within the San Gabriel River Watershed. The San Gabriel River Watershed is in the eastern portion of Los Angeles County where it is bounded by the San Gabriel Mountains to the north, San Bernardino/Orange County to the east, the division of the Los Angeles River from the San Gabriel River to the west, and the Pacific Ocean to the south.[13] The watershed drains into the San Gabriel River from the San Gabriel Mountains flowing 58 miles south until its confluence with the Pacific Ocean. Three flood channels traverse Glendora: Little Dalton Wash, Big Dalton Wash, and San Dimas Wash. The concreted-lined channels serve as floodways that manage floodwater flow.

Flood zones within Glendora are determined by Flood Insurance Rate Maps (FIRMs), produced by FEMA in partnership with various communities. A FIRM is the official flood map that shows a community's flood hazard areas. These may include high-hazard (Special Flood Hazard Areas [SFHA]), moderate- to low-hazard areas, and undetermined areas. A SFHA map shows the 100-year floodplain, divided into zones A and AE.[14] A FIRM also includes 500-year floodplains and higher, classified as moderate and minimal risk areas. The extent or magnitude of flooding is measured by percentage and annual chance floods. A 100- and 500-year flood is an event that has a 1 in 100 (1 percent) and 1 in 500 (0.2 percent) chance, respectively, of occurring in any given year. This data is incorporated into FIRMs to support the National Flood Insurance Program (NFIP) and provide the basis for community floodplain management regulations and flood insurance requirements.

A regulatory floodway is a subset of the 100-year floodplain and is defined by FEMA as the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in flood elevations.

Figure 4-4, *Flood Hazard Zones*, shows the locations of flood zones in Glendora, and Table 4-6, *Acreage by FEMA Flood Zones*, provides the details and acreage of these zones that occur within the planning area. The majority of developed areas in Glendora are identified as Zone X, meaning that the area is located outside of SFHAs and have minimal risk of flood hazard. Potential flooding could occur in a northwestern portion of the City mapped within the 500-year floodplain, generally located along Sierra Madre Avenue. Additionally, a significant portion of the City has not been mapped for flood hazards by FEMA. These unmapped areas occur in the northern and eastern foothills of the City and generally consist of open space and low-density residential uses. Development within flood hazard areas is expected to comply with flood protection standards that reduce vulnerability to flood impacts and ensure safe use and occupation of structures.

[13] County of Los Angeles Public Works, *San Gabriel River Watershed*, http://www.ladpw.org/wmd/watershed/sg/, accessed July 7, 2023.
[14] Federal Emergency Management Agency, *National Flood Insurance Program, Flood Insurance Manual*, April 2024, https://www.fema.gov/sites/default/files/documents/fema_nfip_flood-insurance-manual_042024.pdf, accessed June 10, 2024.



LEGEND

- Critical Facility
- Facility of Concern
- City of Glendora
- Sphere of Influence
- 100-year Flood Zone
- 100-year Flood Zone (contained in channel)
- 500-year Flood Zone
- unshaded — Area of Minimal Flood Hazard
- No Flood Hazard Study has been Conducted

Sources: FEMA National Flood Hazard Layer, Los Angeles County, 10-19-2023; Los Angeles County GIS. Map date: December 12, 2024.

CITY OF GLENDORA, CALIFORNIA

Figure 4-4. Flood Hazard Zones

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

TABLE 4-6: ACREAGE BY FEMA FLOOD ZONES

Flood	Risk	Area (Acres)
100-Year Flood and Regulatory Floodway	High	0.0
500-Year Flood	Moderate to Minimal	49.8
Area of Minimal Flood Hazard (Zone X)	Minimal	5,859.3
Undetermined/No Study Conducted (Zone D)	Undetermined	7,333.5

Source: Federal Emergency Management Agency, June 18, 2024.

Flooding can also occur outside of mapped flood hazard zones during heavy rain events associated with extensive runoff. Localized flooding typically occurs when significant amounts of rain fall over a short time and/or, because of overloaded or blocked stormwater drainage systems that cause sheet flow into streets and low-lying areas.



Source: Ralls, T., ABC 7, *Rain floods Southern California roads*, *https://abc7.com/rain-flooding-mud-slide-socal-camarillo-glendora-silverado-flow-debris-southern-california-la/419008/*, accessed November 21, 2024.

Previous Occurrences

Past occurrences of flood damage in the City of Glendora have occurred as early as 1938, when one of the worst rainstorms on record caused overflow of the Little Dalton Wash channel and street flooding throughout the City.[15] Another significant flood event affecting the City of Glendora occurred in 1969 and was caused by intense rainfall.[16] The 1969 flood event had a significant impact, particularly in the northern part of the City, where flooding and mudslides caused over 50 million dollars in damages to private and public properties. Improvements to City and County flood control systems after these events has greatly reduced the flooding hazard in Glendora.

[15] The Glendora Press-Gleaner, *Glendora Escapes with Minor Damage as Rain Floods Southland Area*, March 4, 1938, https://ccdl.claremont.edu/digital/collection/cwd/id/4756, accessed June 10, 2024.
[16] U.S. Geologic Survey, *Flood of January 1969 near Azusa and Glendora, California*, https://pubs.er.usgs.gov/publication/ha424, accessed June 10, 2024.

The National Weather Service report, *A History of Significant Weather Events in Southern California*, includes a chronological list of events organized by weather type.[17] One of these events specifically mentions heavy rainfall occurring in Glendora in 1956. Additionally, the National Oceanic and Atmospheric Administration (NOAA) Storm Event Database summarizes flood events of regional significance affecting the City of Glendora. These are documented below:[18]

- In May 1998, heavy rain produced local urban flooding across Los Angeles County. Local street flooding was reported in Glendora.
- In April 1999, moderate to locally heavy rainfall produced minor street flooding across coastal areas of Ventura and Los Angeles counties.
- In February 2000, heavy rain totaling two to six inches produced flash flooding across Santa Barbara, Ventura, and Los Angeles counties. Flash flooding and mudslides closed parts of San Gabriel Canyon Road in the Angeles National Forest. The heavy showers resulted in numerous reports of street flooding across the area.
- In March 2000, heavy showers produced widespread street flooding across Los Angeles County.
- In April 2000, a powerful Pacific storm brought heavy rain, causing urban flooding in Los Angeles County.
- In March 2001, Los Angeles county received one to three inches of heavy rainfall, with numerous reports of flooding and mudslides.
- In February 2003, a powerful winter storm brought heavy rain to southern California. Rainfall totals over coastal areas ranged from one to five inches with higher amounts in the mountains. Widespread flooding was reported across Los Angeles County.
- In January 2005, a powerful Pacific storm brought heavy rain, snow, flash flooding, high winds and landslides to central and southern California. During the five-day event, rainfall totals ranged from three to 10 inches over coastal areas with up to 32 inches in the mountains
- In January 2008, a powerful Pacific storm brought strong winds, heavy rainfall, flash flooding, and winter storm conditions to central and southern California. Rainfall totals ranged from five to 11 inches in the foothills and mountains. The heaviest rainfall fell over favored south-facing mountain slopes.
- In January 2010, a series of powerful winter storms affected central and southern California. As this series of storms moved across the area, they brought heavy rain, flash flooding, gusty

[17] National Weather Service, *A History of Significant Weather Events in Southern California*, https://www.weather.gov/media/sgx/documents/weatherhistory.pdf, March 2024.
[18] National Oceanic and Atmospheric Administration, *Storm Events Database*, https://www.ncdc.noaa.gov/stormevents/, accessed Jun 10, 2024.

winds, heavy snow, and severe weather to the area. Rainfall ranged from eight to 16 inches in the foothills and mountains.

- In February 2014, heavy showers and thunderstorms moved across the communities of Azusa and Glendora, generating flash flooding and debris flows. Rainfall totals ranged from between six and 12 inches across the mountains and foothills. Law enforcement reported that several homes were damaged due to debris flows.
- In January 2016, a powerful winter storm brought heavy rain and snow, flash flooding, and gusty winds to the Los Angeles area. Rainfall totals from this storm generally ranged between two and six inches with locally higher amounts in some foothill areas.
- In December 2021, a winter storm hit southern California, producing heavy rainfall ranging between two to eight inches. Numerous reports of nuisance roadway flooding as well as downed trees were reported.
- In August 2023, Tropical Storm Hilary brought heavy rain and significant flooding to Ventura and Los Angeles counties. Rainfall totals in mountain areas ranged between three to nine inches. Rainfall rates were impressive, with rates of around one inch in less than an hour reported at times. With such heavy rainfall, numerous reports of flash flooding as well as mud and debris flows were received.

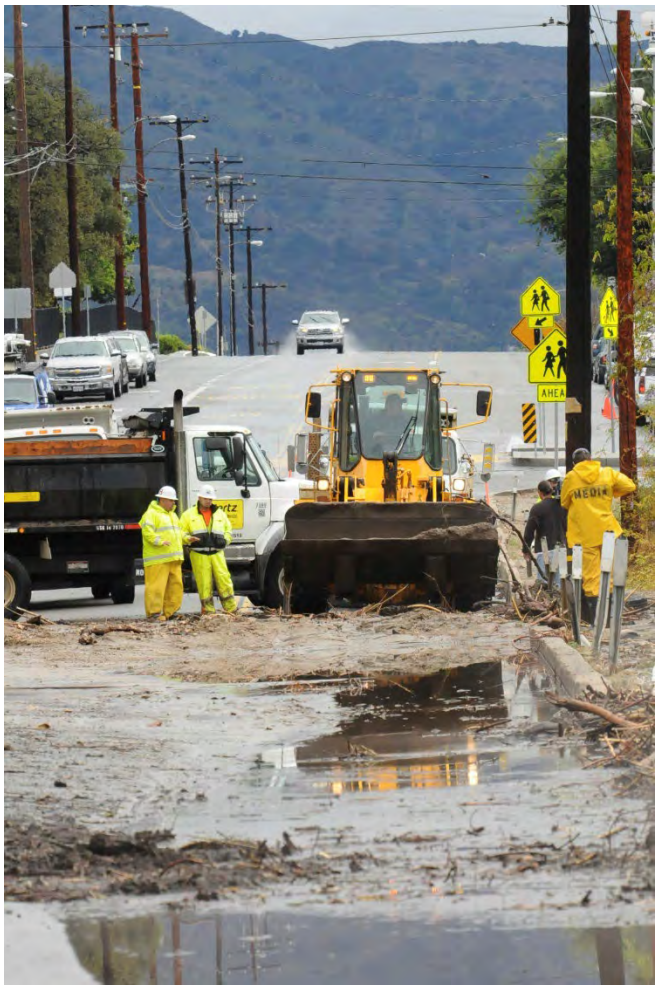
Probability of Future Occurrences

This section addresses flooding resulting from heavy precipitation events, distinct from flooding caused by reservoir or dam failure, which was covered in the previous section. Areas within the 100-year flood zone have a 1 percent chance of flooding in any given year. However, Glendora has no areas within this high-risk zone. The 500-year flood zone, with a much lower risk of flooding (0.2 percent chance per year), includes a small area of approximately 49.8 acres in the northwestern part of the city, near Sierra Madre Avenue. Flooding incidents are most likely to occur within FEMA-designated flood zones.

The City and County maintain an extensive storm drain system that would normally divert any excessive rainfall into appropriate channels. After the historic flooding events discussed above, the City made improvements to infrastructure such as the construction of dams, basins, and flood control channels to mitigate flood hazards. These improvements decrease the probability of a major flood occurrence in the City. Additionally, the City prohibits development in any area determined to be subject to flood hazard by reason of inundation, overflow, or erosion unless provisions are made to eliminate the hazards to the satisfaction of the City Engineer by providing adequate drainage facilities, protective walls or devices, suitable fill, raising the floor level of the structures, or by a combination of methods. The City also prepares for flood events by maintaining and proactively removing debris prior to significant rain events. However, infrastructure and flood control facilities could be overwhelmed during a large storm event, resulting in flooding not limited to the FEMA flood zones. The probability of future occurrences is considered likely.

Climate Change Considerations

Climate change is expected to influence the frequency and intensity of precipitation events throughout California and could have a direct effect on flooding. According to research conducted by UCLA, California will experience extremely wet and extremely dry seasons by the end of the century. It is predicted that "over the next 40 years, the State will be 300 to 400 percent more likely to have a prolonged storm sequence as severe as the one that caused the legendary California flood more than 150 years ago."[19] The Fourth Climate Change Assessment indicates the intensity of heavy precipitation events is increasing and identifies a medium-high confidence for future change. While the annual rainfall averages may remain constant, the wet season may be narrower, leading to large downpours in a short period of time that overwhelm infrastructure and lead to increased flooding. With population density and increased urbanization of Los Angeles County, increased precipitation events and associated flooding could be devastating.



Source: City of Glendora, February 28, 2014.

[19] Colgan, D. (UCLA), *Study forecasts a severe climate future for California*, April 2018, https://newsroom.ucla.edu/releases/california-extreme-climate-future-ucla-study, accessed June 10, 2024.

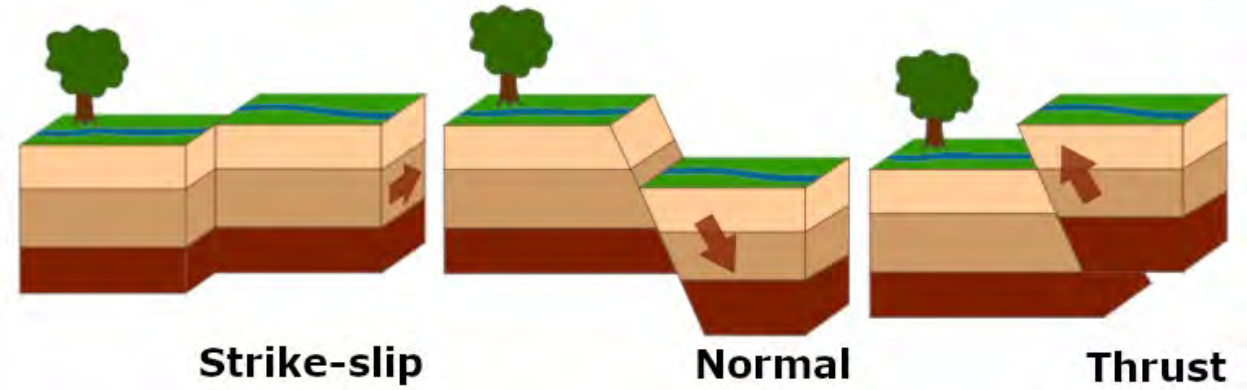
SEISMIC AND GEOLOGIC HAZARDS

Description

Surface Faulting and Ground Motion

The US Geological Survey (USGS) defines an earthquake as a sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by the slip (or any other sudden stress changes in the earth).[20] Faults are fractures along the earth's crust between two blocks of earth and can be defined as a strike slip, normal, or thrust faults, as depicted in Figure 4-5, *Types of Faults*, below.

FIGURE 4-5: TYPES OF FAULTS



Source: U.S. Geological Survey, *Earthquake Hazards Program,* https://www.usgs.gov/programs/earthquake-hazards, accessed June 11, 2024.

Fault movement can occur rapidly, in the form of an earthquake, or may occur slowly, in the form of creep. During an earthquake, the rock on one side of a fault suddenly slips with respect to the other. Earthquakes occur without warning and result in effects such as ground motion, surface faulting, and ground failure (including liquefaction and landslides), described below.

Ground motion is seismic shaking (vibration) of the ground during an earthquake.[21] When a fault ruptures, seismic waves radiate in all directions and cause the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can further amplify ground motion.

Seismic shaking can be strong enough to result in widespread devastation or virtually undetectable by the average person. The intensity of seismic shaking is a result of the release by the fault rupture (how much of the accumulated stress was released), the length of the rupture (the longer the slip along the fault line, the greater the shaking), and the depth at which the rupture occurs (ruptures that occur closer to the surface often cause stronger shaking). Usually, areas

[20] U.S. Geological Survey, *Earthquake Hazards Program*, https://www.usgs.gov/glossary/earthquake-hazards-program, accessed June 11, 2024.
[21] U.S. Geological Survey, *What are the Effects of Earthquakes?,* https://www.usgs.gov/programs/earthquake-hazards/what-are-effects-earthquakes, accessed June 11, 2024.

closest to the site of the rupture experience the greatest shaking, although differences in geology and soil can also have an impact.

Seismic shaking can damage or destroy buildings and structures and may cause partial or total collapse. Ground movement can damage or destroy infrastructure on or beneath the surface, such as roads, rail lines, and utility lines and pipes. This in turn, can cause hazardous materials releases, water main breaks, and other dangerous situations resulting from infrastructure failure. Falling debris and structures also create a risk of personal injury or death.

Surface faulting is the differential movement of two sides of a fracture, where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults, which occur based on the type of underlying fault.

Faults occur at the boundaries between large sections of the earth's surface, called tectonic plates. While most of California sits on the North American plate, the San Gabriel Valley area (which includes the City of Glendora) is on the Pacific plate. The San Andreas Fault is the main boundary between the North American and Pacific plates, but other fault lines can be found up to 200 miles away. The presence of the San Andreas Fault and other faults is the reason for California's frequent seismic shaking and other tectonic activity.

Landslides, Mudflows, and Slope Instability

Areas with steep slopes and valleys are potentially subject to instability. These areas may be prone to hazards such as rock falls, slope failures, and debris flows (mudflows). While seismic shaking can cause landslides, other causes can include erosion, soil saturation, excess weight from accumulation of rain or snow, and human-made conditions such as construction disturbance or vegetation removal.

When a hillside or other slope becomes unstable, the soil and rocks that make up the slope slide toward the bottom. Landslides are often sudden, although some occur very slowly over a long period of time. Loose and fractured materials are more likely to slide than compact materials or solid rock, and steep slopes are at greater risk than gentle rises. Areas that have been recently burned by wildfires are more susceptible to sliding because the fire destroys the plant cover that helps stabilize slopes.

Regardless of the cause or specific form, a landslide can damage or destroy structures built on the sliding material or in its path. Underground infrastructure, such as pipelines or telecommunication lines, may be severed during a landslide. This could lead to infrastructure-induced flooding if water pipes are broken. In addition to property damage, landslides can crush or bury people, creating a risk of serious injury or death.

Liquefaction

Liquefaction is a phenomenon that occurs when ground shaking causes saturated soils, primarily clay-free deposits such as sand or silt, to lose strength and act like a viscous fluid. Soils that are poorly consolidated and combine with groundwater during an earthquake lose their shear strength and take on the properties of a heavy liquid. Certain soils are more susceptible to liquefaction, particularly younger and looser sediment closer to the water table. Liquefaction causes three types of ground failure, as described below:[22]

- Lateral spreads involve the lateral movement of large blocks of soil as a result of liquefaction of an underlying layer. They generally develop on gentle slopes, most commonly between 0.3 and 3 degrees. Horizontal movements commonly are as much as 10 to 15 feet. However, where slopes are particularly favorable, and the duration of ground shaking is long, lateral movement may be as much as 100 to 150 feet. Lateral spread usually breaks up internally, forming numerous fissures and scarps.
- Flow failures consist of liquefied soil or blocks of intact material riding on a layer of liquefied soil and are the most catastrophic type of ground failure caused by liquefaction. They commonly move several feet and up to dozens of miles under certain conditions. Flow failures usually form in loose saturated sands or silts on slopes greater than three degrees.
- Loss of bearing strength occurs when the soil supporting buildings or other structures liquefies. When large deformations occur, structures settle and tip. The general subsurface geometry required for liquefaction-caused bearing failures is a layer of saturated, cohesionless soil that extends from near the ground surface to a depth equal to about the width of the building.

Location and Extent

Surface Faulting and Ground Motion

The City of Glendora is located within the seismically active southern California region. The City is underlain by the Sierra Madre Fault Zone, a major fault zone which runs along the southern margin of the San Gabriel Mountains. In addition, several other major faults are located within the region that could have an impact on the City; refer to Figure 4-6, *Regional Fault Map*. The San Andreas Fault, considered the most seismically active fault in the southern California region, is located approximately 20 miles northeast of the City.

Earthquakes that could affect the City would most likely originate from the Sierra Madre or San Andreas Fault Zones, described below. These faults are close enough in proximity or expected to generate strong enough shaking that could affect the City. Geologic conditions within the foothill portions of the City could be impacted more severely due to the steep topography and the relative instability of some of the geologic units in this portion of the City.

[22] U.S. Geological Survey, *What are the Effects of Earthquakes?,* https://www.usgs.gov/programs/earthquake-hazards/what-are-effects-earthquakes, accessed June 11, 2024.

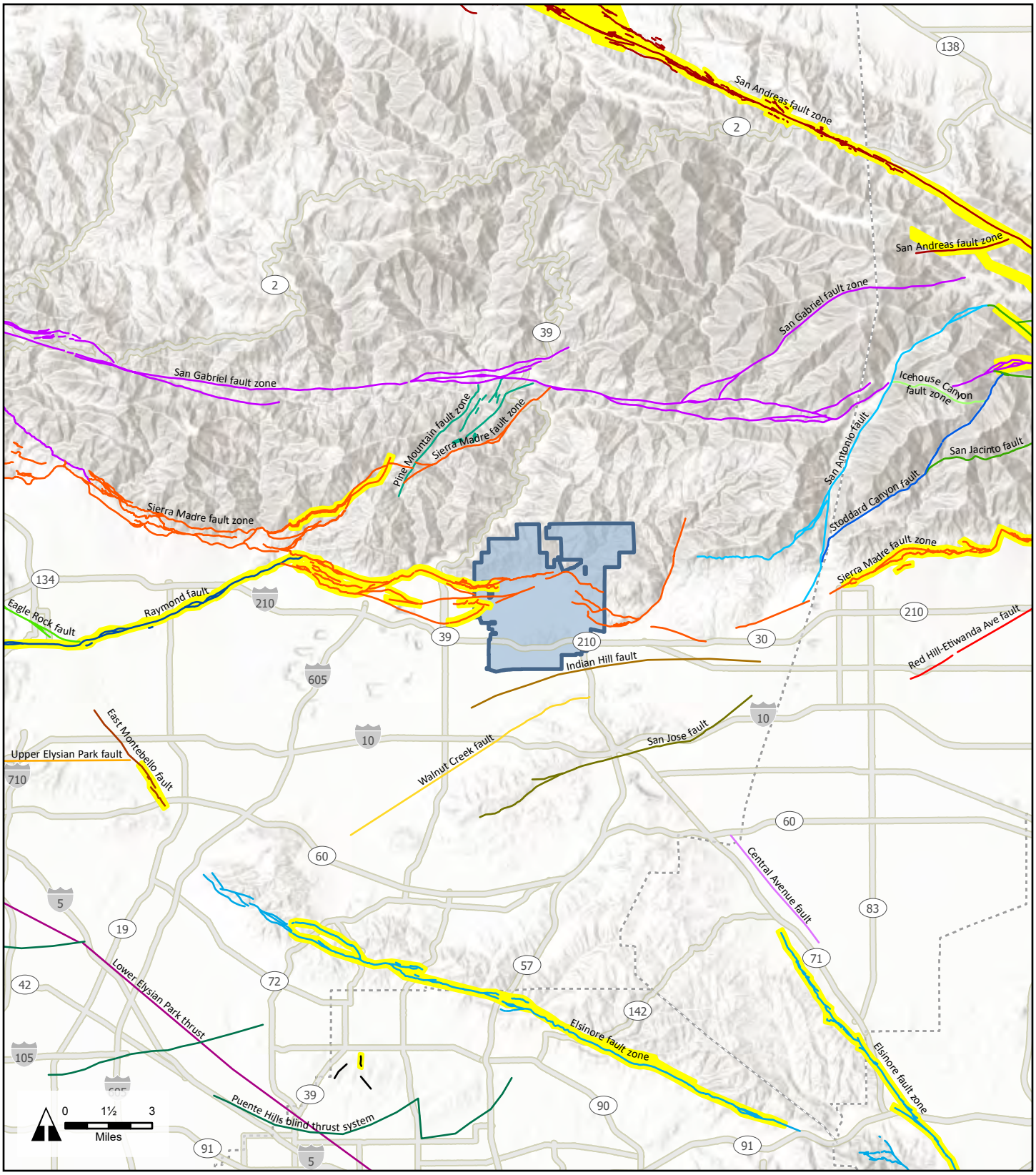
- Sierra Madre Fault Zone: The Sierra Madre Fault Zone consists of east-west trending faults and folds, which extend along the southern margin of the San Gabriel Mountains. This fault zone is approximately 35 miles in length and terminates at Dalton Canyon to the east and at the San Fernando Fault to the west. This fault is composed of five individual segments, which range in activity. Portions of the City overlying this fault are located within Alquist-Priolo Special Study zones; the segments within the City are considered potentially active. Data gathered on this fault suggests that the slip rate ranges from 0.36 to 4 millimeters per year and this fault is expected to generate earthquakes with a magnitude of 6.0-7.0.[23] Faults that are associated with this fault system include the:
    - Cucamonga Fault
    - Duarte Fault
    - San Fernando Fault
    - San Gabriel Fault
    - Clamshell-Sawpit Canyon Fault
    - Raymond Fault
- San Andreas Fault Zone: The San Andreas Fault Zone, located approximately 20 miles northeast of the City, is a right-lateral strike-slip that extends approximately 745 miles from Cape Mendocino to the Salton Sea. It has caused numerous major earthquakes throughout California's history and has the potential to cause destructive ground shaking in the southern California region. Data gathered on this fault suggests that the slip rate ranges from 20 to 35 millimeters per year and this fault is expected to generate earthquakes with a magnitude of 6.8-8.0.

Southern California is subject to potential ground shaking in the event of an earthquake. Ground shaking can result in extensive structural damage, injury, and death. Ground shaking would be particularly damaging to residential buildings constructed of wood or reinforced masonry construction, and to mobile homes. Other buildings that do not typically perform well in earthquakes are soft-story buildings. These types of buildings have a story (typically the first floor) that lacks adequate strength or toughness due to too few shear walls.



Source: County of Los Angeles Fire Department, *Northridge Earthquake 30th Anniversary: Reflections and Lessons Learned*, https://fire.lacounty.gov/northridge-earthquake-30th-anniversary-reflections-and-lessons-learned/, accessed November 21, 2024.

[23] Southern California Earthquake Center, *Earthquake Information*, https://scedc.caltech.edu/earthquake/sierramadre.html, accessed June 11, 2024.



LEGEND

- City of Glendora
- County Boundary
- Quaternary Fault (various colors)
- Alquist-Priolo Zone of Required Investigation

CITY OF GLENDORA, CALIFORNIA

Figure 4-6. Regional Fault Map

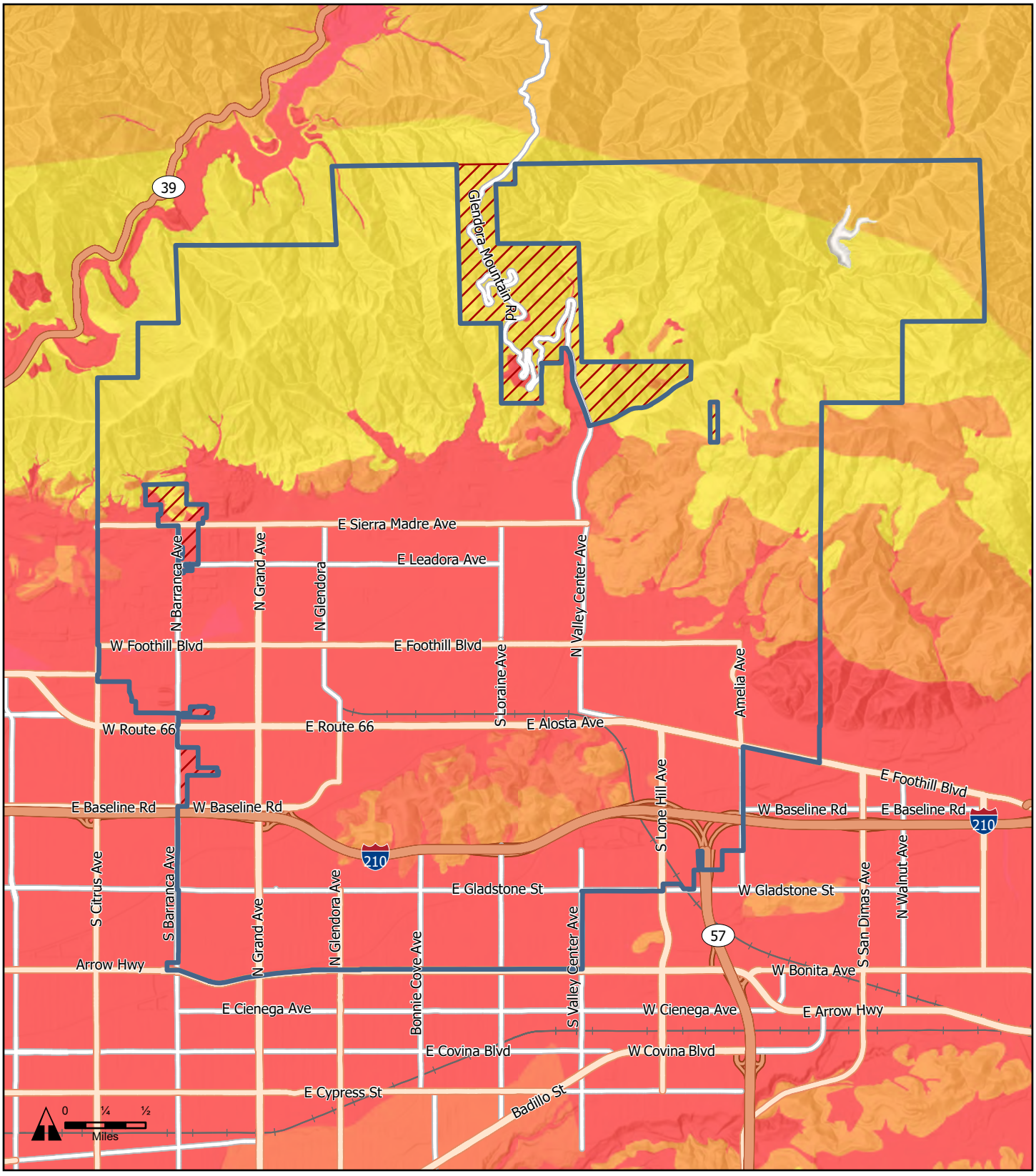
Sources: California Geological Survey; US Geological Survey; California State Geoportal. Map date: December 12, 2024.

Intensity and Magnitude

Earthquake ground shaking is generally expressed in terms of intensity and magnitude. Several scales may be used to measure the strength or intensity of an earthquake.[24] Magnitude scales, like the moment magnitude (Mw), measure the size of the earthquake at its source. An earthquake event has a single magnitude; however, the degree of ground shaking that the earthquake causes varies from place to place based on distance, type of surface material, and other factors. Figure 4-7, *Earthquake Shaking Potential*, shows the potential for the City to experience earthquake ground shaking. As shown, the entire City is identified as having lower-to-moderate ground shaking potential, with more populated flat areas generally having a higher ground shaking potential than the hillside areas.

In contrast to magnitude, other scales describe earthquake intensity, which can vary depending on distance from earthquake epicenter and local characteristics. The Modified Mercalli intensity scale expresses earthquake intensity experienced at a particular location on a scale of increasing levels of intensity that range from imperceptible shaking to catastrophic destruction. It does not have a mathematical basis; instead, it is an arbitrary ranking based on observed effects. The level of intensity assigned to a specific location is a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects experienced. Table 4-7, *The Modified Mercalli Intensity Scale*, lists abbreviated descriptions of the Modified Mercalli intensity levels.

[24] U.S. Geological Survey, *Earthquake Magnitude, Energy Release, and Shaking Intensity*, https://www.usgs.gov/programs/earthquake-hazards/earthquake-magnitude-energy-release-and-shakingintensity#:~:text=Moment%20Magnitude%20(MW)%20is,magnitude%20range%20where%20they%20overlap, accessed June 11, 2024.



LEGEND

City of Glendora

Sphere of Influence

Earthquake Shaking Potential

Highest — decreasing intensity — Lowest

CITY OF GLENDORA, CALIFORNIA

Figure 4-7. Earthquake Shaking Potential

Sources: California Geological Survey Map Sheet 48, Earthquake Shaking Potential for California 2016; Los Angeles County GIS. Map date: March 7, 2024.

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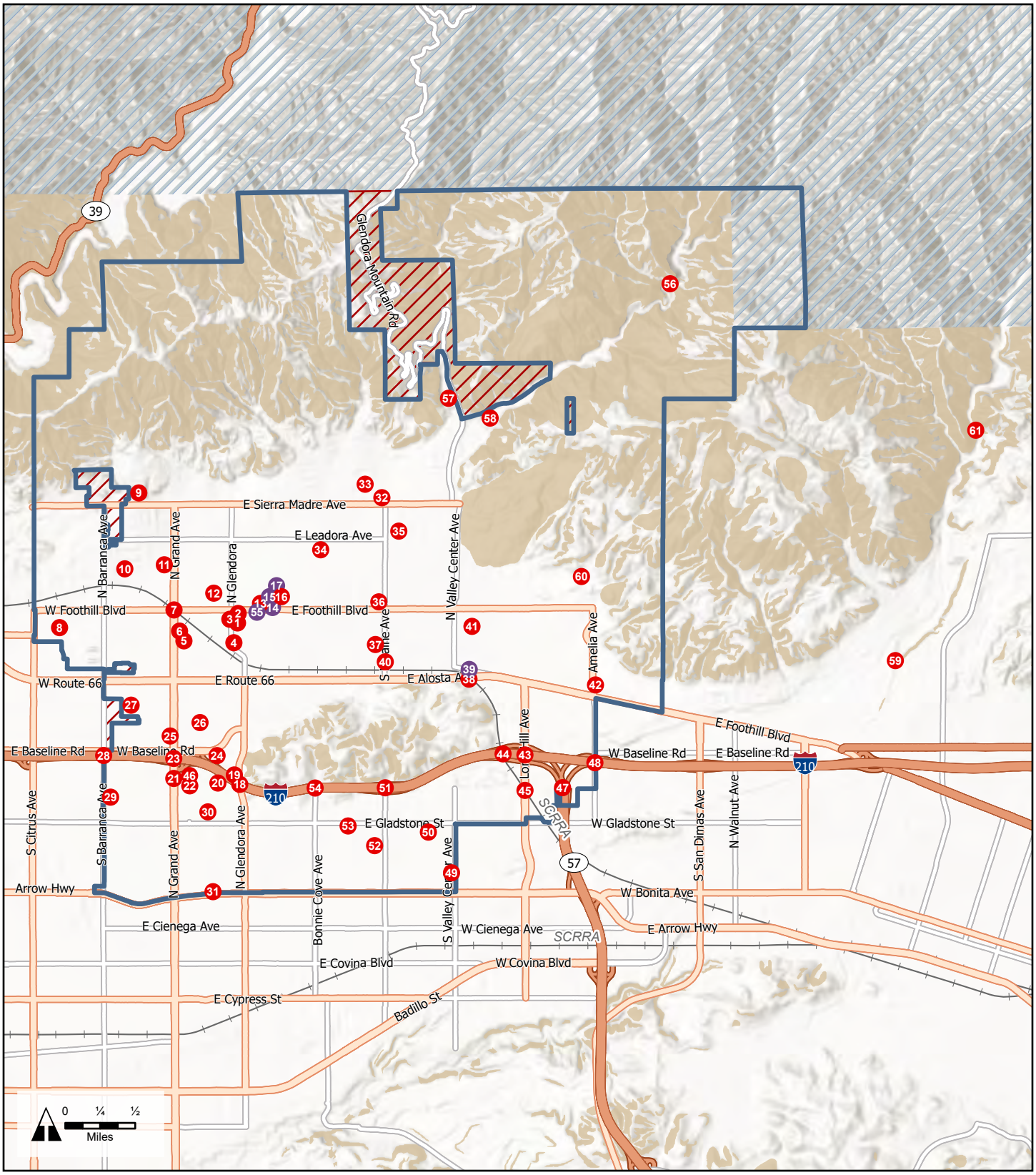
TABLE 4-7: THE MODIFIED MERCALLI INTENSITY SCALE

Intensity	Shaking	Description/Damage
I	Not Felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes and windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specifically designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: U.S. Geological Survey, *The Modified Mercalli Intensity Scale*, https://www.usgs.gov/natural-hazards/earthquake-hazards/science/modified-mercalli-intensity-scale?qt-science_center_objects=0#qt-science_center_objects, accessed June 11, 2024.

Landslides, Mudflows, and Slope Instability

The topography of Glendora includes areas characterized by moderate to very steep hillsides and therefore has the potential for slope instability and landslides. According to the General Plan Safety Element, geologic conditions within the foothill portions of Glendora could be impacted more severely due to the steep topography and the relative instability of some of the geologic units in this area of the City. Such areas may be prone to hazards such as surficial failures, mudflows, debris flows, rock falls, soil creep, and erosion. Failures of human-made slopes could also occur in some of the previously developed areas of the City. In addition, wildfires can destabilize hillsides and create hydrophobic soils, leading to an increased potential of landslides and debris flows. The potential for earthquake-induced landslides in hillside terrain is also present. Areas of known landslides or areas generally susceptible to landslides and slope instability within Glendora have been identified and mapped by the California Geological Survey (CGS); refer to Figure 4-8, *Landslide Hazard Zones*. As shown, areas susceptible to landslides include the northern and eastern foothills of the City, as well as the “South Hills” located in the southern portion of the City.



LEGEND

- Critical Facility
- Facility of Concern
- City of Glendora
- Sphere of Influence
- Landslide Zone

CITY OF GLENDORA, CALIFORNIA

Figure 4-8. Landslide Hazard Zones

Sources: California Geological Survey Regulatory Maps Portal; Los Angeles County GIS. Map date: December 12, 2024.

Liquefaction

Liquefaction generally occurs within areas that have high groundwater (less than 50 feet below the earth's surface), loose sandy alluvial deposits (usually of recent age), and the potential for significant ground shaking. Available data indicates that groundwater levels beneath the City range between 100 to 150 feet deep. Certain locations, however, have shallow groundwater conditions and could be susceptible to liquefaction. Areas susceptible to liquefaction within the City have been identified and mapped by the CGS; refer to Figure 4-9, *Liquefaction Hazard Areas*. As shown, areas susceptible to liquefaction include the northern foothills, a western portion of the City along Foothill Boulevard, and the southeastern portion of the City along Interstate 210 (I-210).

Previous Occurrences

Surface Faulting, Ground Motion, and Liquefaction

As discussed above, a variety of faults are located within and near the City of Glendora. Table 4-8, *Major Earthquake Faults of Particular Concern*, identifies faults of concern and last major ruptures.

TABLE 4-8: MAJOR EARTHQUAKE FAULTS OF PARTICULAR CONCERN

Fault Name	Type of Faulting	Last Major Rupture	Slip Rate	Interval Between Major Ruptures	Probable Magnitude (Mw)
Cucamonga	Thrust	Very recent Holocene	5 to 14 mm/year	Estimated roughly between 600-700 years	6.0 – 7.0
Elsinore	Right-lateral strike-slip	May 15, 1910 (Mw6, no surface rupture observed)	Roughly 4.0 mm/year	Roughly 250 years	6.5 – 7.5
Newport Inglewood	Right-lateral; local reverse slip associated with fault steps	March 10, 1933 (Mw6.4, no surface rupture)	0.6 mm/year	Unknown	6.0 - 7.0
Palo Verdes	Right-reverse	Holocene, offshore; Late Quaternary, onshore	0.1 to 3.0 mm/year	Unknown	6.0 – 7.0
Santa Monica	Left-reverse	Late Quaternary	0.27 to 0.39 mm/year	Unknown	6.0 – 7.0
San Andreas	Right-lateral strike-slip	January 9, 1857 (Mojave segment)	20 to 35 mm/year	Average of about 140 years on the Mojave segment; recurrence interval varies greatly	6.8 – 8.0
San Fernando	Thrust	February 9, 1971 (Mw6.6).	5 mm/year	Roughly 200 years	6.0 – 6.8
San Jacinto	Right-lateral strike-slip	April 9, 1968 (Mw6.5 on Coyote Creek segment)	7 to 17 mm/year	Between 100 and 300 years	6.5 – 7.5
Sierra Madre	Reverse	Holocene	0.36 to 4 mm/year	Several thousand years	6.0 – 7.0

Sources: Southern California Earthquake Center, *Earthquake Information*, https://scedc.caltech.edu/earthquake/faults.html, accessed on June 11, 2024.
Notes: mm = millimeters; Mw = moment magnitude

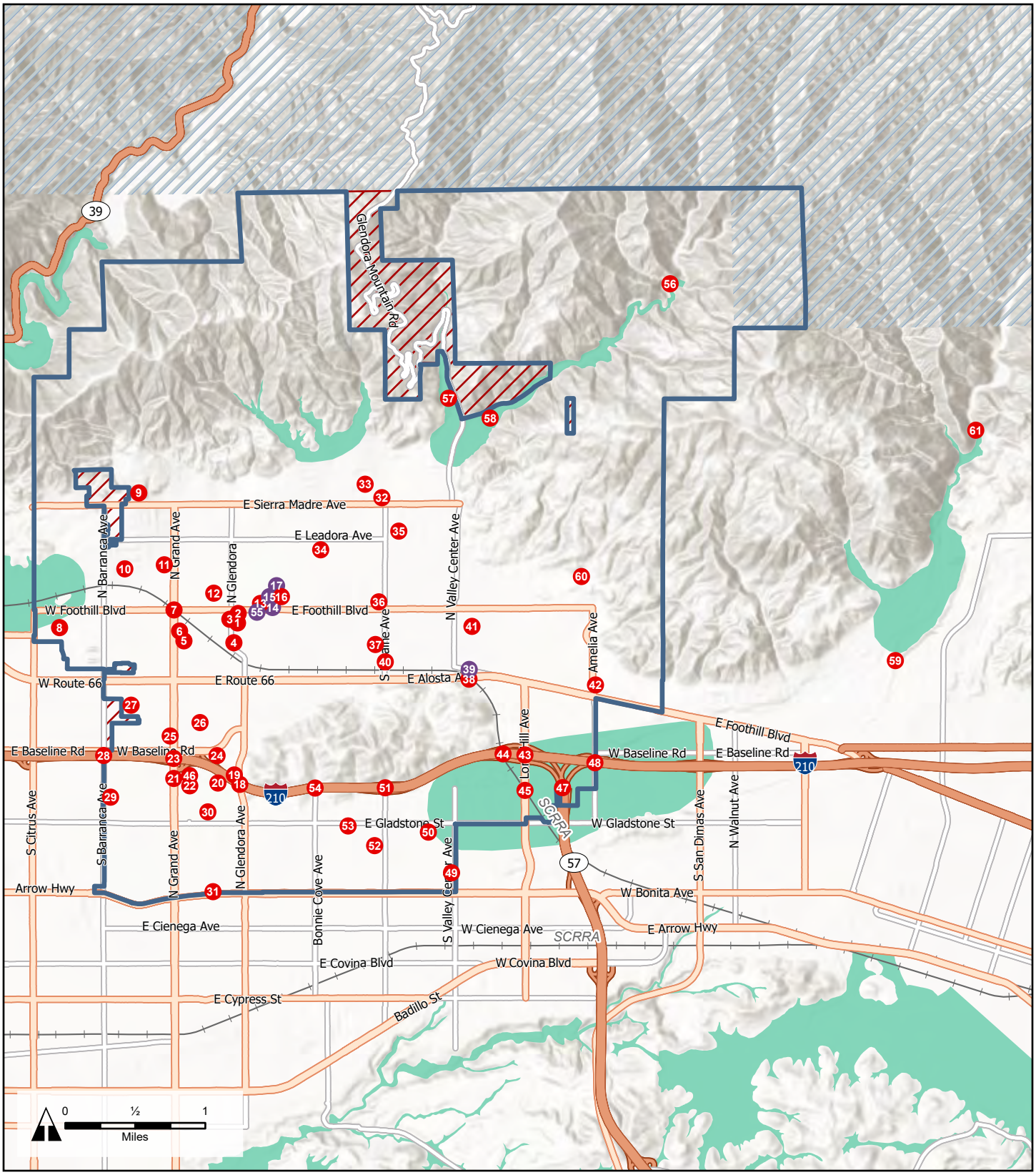
Table 4-9, *Significant Historical Earthquakes in Southern California*, identifies major earthquakes that have occurred in southern California. The Northridge Earthquake and the Whittier Narrows Earthquake both resulted in major disaster declarations from the federal government, which included Los Angeles County as a designated area.[25]

[25] Federal Emergency Management Agency, *Disasters and Other Declarations*, https://www.fema.gov/disaster/declarations, accessed June 12, 2024.

TABLE 4-9: SIGNIFICANT HISTORICAL EARTHQUAKES IN SOUTHERN CALIFORNIA

Earthquake Name	Year	Estimated Magnitude
Wrightwood	1812	7.5
Santa Barbara Earthquake	1812	7.1
Los Angeles	1855	6.0
Palmdale	1857	6.3
San Bernardino	1858	6.0
Wrightwood	1899	6.4
San Jacinto	1899	6.7
Elsinore	1910	6.0
San Jacinto	1918	6.8
North San Jacinto	1923	6.3
Long Beach	1933	6.4
San Fernando	1971	6.5
Whittier Narrows	1987	5.8
Landers	1992	7.2
Big Bear	1992	6.5
Northridge	1994	6.7
Chino Hills	2008	5.4
Ridgecrest	2019	7.1

Source: Southern California Earthquake Data Center, *Significant Earthquakes and Faults*, http://scedc.caltech.edu/significant/index.html, accessed June 12, 2024; California Department of Conservation, *California's Big Earthquakes*, https://www.conservation.ca.gov/cgs/earthquakes/significant, accessed June 12, 2024; U.S. Geological Survey, *Search Earthquake Catalog*, https://earthquake.usgs.gov/earthquakes/search/, accessed June 12, 2024.



LEGEND

- Critical Facility
- Facility of Concern
- City of Glendora
- Sphere of Influence
- Liquefaction Zone

CITY OF GLENDORA, CALIFORNIA

Figure 4-9. Liquefaction Hazard Areas

Sources: California Geological Survey Regulatory Maps Portal; Los Angeles County GIS. Map date: December 12, 2024.

Liquefaction-induced ground failure historically has been a major cause of earthquake damage in southern California. During the 1971 San Fernando and 1994 Northridge earthquakes, significant damage to roads, utility pipelines, buildings, and other structures in the Los Angeles area was caused by liquefaction-induced ground displacement.[26] According to the CGS Seismic Hazard Zone Reports, no areas of documented historic liquefaction are known within the City limits or the larger Glendora, Azusa, Baldwin Park, and San Dimas Quadrangles.[27]

Landslides, Mudflows, and Slope Instability

Like much of California, Los Angeles County has experienced landslides. Landslides in Los Angeles are generally trigged by intense and/or prolonged rainfall but can also occur after an earthquake. [28] There were 17 federally declared landslide disasters in Los Angeles County between 1953 and 2019.[29]

CGS landslide mapping identifies numerous landslide events that have occurred in Glendora, specifically within the northern and eastern foothills and South Hills. [30] Significant landslides in Glendora include the 1969 landslide, which destroyed approximately 175 homes due to debris flow and caused nearly 14.6 million dollars in damages. More recently, Glendora experienced mudflows in 2014 due to heavy winter storms, prompting evacuations in the foothills affected by the Colby Fire.[31]



Source: City of Glendora, 1969.

Probability of Future Occurrences

Surface Faulting, Ground Motion, and Liquefaction

The City of Glendora is in a known seismically active area, and thus the probability for future seismic hazard occurrences is considered high. Given the significant seismic shaking events in the region, it is certain that such events will continue. The southern California region has many fault lines (including major faults), and it is almost inevitable that a regional fault line will rupture in the foreseeable future and cause a major seismic shaking event.

The USGS Uniform Earthquake Rupture Forecast Version 3 released in 2017 provides a perspective of the likelihood each California region will experience a magnitude 6.7 or larger earthquake in the next 30 years; refer to Table 4-10, *Los Angeles Region Earthquake*

[26] California Department of Conservation, Division of Mines and Geology, *Seismic Hazard Zone Report for the Glendora, Azusa, San Dimas, and Baldwin Park 7.5-Minute Quadrangles, Los Angeles County, California*, 1998.
[27] Ibid
[28] County of Los Angeles, *2020 County of Los Angeles All-Hazards Mitigation Plan*, 2020.
[29] California Governor's Office of Emergency Services, *California State Hazard Mitigation Plan*, November 2023.
[30] California Department of Conservation, *Landslide Inventory*, https://maps.conservation.ca.gov/cgs/lsi/app/, accessed June 13, 2024.
[31] Guinyard, T., Lopez, A., and Lloyd J., *Glendora Police: Evacuate Before It's Too Late*, February 2014, https://www.nbclosangeles.com/news/local/mud-debris-flows-reported-in-glendora/1972470/, accessed June 13, 2024.

Probabilities, and Table 4-11, *Likelihood of One or More Earthquakes Occurring in the Next 30 Years in Los Angeles County Region by Fault*.

TABLE 4-10: LOS ANGELES REGION EARTHQUAKE PROBABILITIES

Magnitude (greater than or equal to)	Average Repeat Time (years)	30-Year Likelihood of One or More Events
5.0	1.4	100%
6.0	10	96%
6.7	40	60%
7.0	61	46%
7.5	109	31%
8.0	532	7%

Source: U.S. Department of the Interior and U.S. Geological Survey, *UCERF3: A New Earthquake Forecast for California's Complex Fault System Fact Sheet*, March 2015.

Notes:

1. M≥5 means magnitude greater than or equal to 5.0, and likewise for the other two magnitude thresholds.
2. The 30-year period measured by this report is 2014 to 2044; a 30-year period is used as it is the typical duration of a homeowner mortgage.
3. Actual repeat times will exhibit a high degree of variability and will almost never exactly equal the average listed in the table above.

TABLE 4-11: LIKELIHOOD OF ONE OR MORE EARTHQUAKES OCCURRING IN THE NEXT 30 YEARS IN LOS ANGELES COUNTY REGION BY FAULT

Magnitude	Sierra Madre, Subsection 2	Cucamonga, Subsection 3	Elsinore (Glen Ivy) rev, Subsection 0	Newport-Inglewood alt 2, Subsection 4	San Andreas San Bernardino N), Subsection 1
M≥6.7	1.12%	1.08%	3.21%	0.74%	22.44%
M≥7.0	1.08%	0.98%	1.81%	0.61%	19.74%
M≥7.5	0.72%	0.63%	1.01%	0.27%	16.13%
M≥8.0	0.03%	0.03%	<0.01%	--	6.61%

Source: U.S. Department of the Interior and US Geological Survey, *The Third California Earthquake Rupture Forecast (UCERF3), Google Earth file with fault probabilities*, March 2015.

Notes:

1. M≥6.7 means magnitude greater than or equal to 6.7, and likewise for the other magnitude thresholds.
2. Values shown are the magnitude mean over a 30-year period (2014 to 2044); a 30-year period is the typical duration of a homeowner mortgage.

Based on the data, and the historic occurrences of earthquake activity in southern California, it is concluded that the probability of future occurrences impacting the City is highly likely.

Landslides, Mudflows, and Slope Instability

Glendora's steep topography and geological conditions make it especially vulnerable to slope instability and landslides. Additionally, the City and surrounding San Gabriel Mountains are prone to wildfires, which can further destabilize hillsides and create hydrophobic soils, increasing the likelihood of landslides and debris flows. Earthquake-induced landslides in the area's hillside terrain also pose a risk. Given these factors, the probability of future landslides, mudflows, and other slope stability issues impacting the City is considered highly likely.

Climate Change Considerations

Surface Faulting, Ground Motion, and Liquefaction

Earthquakes are caused by seismic activity, which is not directly correlated with climate change. Therefore, climate change is not expected to cause any changes to the frequency or intensity of seismic shaking or liquefaction with Glendora or the region.

Landslides, Mudflows, and Slope Instability

Climate change could bring increased drought conditions, resulting in drier soil conditions, as well as a possibility of increased precipitation levels of greater frequency and duration. Drought conditions cause soil to dry out over time, reducing the ability for soils to absorb precipitation when storms occur. Decreased absorption can result in increased amounts of runoff with the potential for landslide and/or mudflow conditions. More significant or frequent storm events can also result in more precipitation to be absorbed by the soil of slopes in Glendora and could destabilize hillsides and cause an increase in the frequency of landslide events, mudflows, or liquefaction. Increased temperatures and dry conditions can also result in wildfires. When wildfires burn through an area, they often cause reduced vegetation and destabilization of soil that can also result in landslides or mudflows during intense storm events.

SEVERE WEATHER

Description

Heavy Rains

During severe weather events such as strong storms, rain can fall at such a high rate that it cannot drain away fast enough. Heavy rain can cause flooding, leading to inundation and potential damage to buildings, roadways, and other critical infrastructure. Heavy rainfall conditions can also trigger landslides, mudflow, and slope instability due to the added weight of rain-saturated slopes and weakened slopes from the pressure the groundwater exerts on porous hillside materials. In California, heavy rainfall events are often short, intense bursts of rain, but in some cases, heavy rain can persist for multiple days.

Thunderstorms are rainstorms with lightning that can also include strong winds and hail. According to the National Weather Service, a severe thunderstorm must have at least one of the following: hail that is one inch in diameter or larger; or winds of 58 miles per hour or greater.[32] Such storms form from a combination of moisture, rapidly rising warm air, and a force capable of lifting air, such as a warm front, cold front, or mountain. Typical thunderstorms are 15 miles in diameter and last an average of 30 minutes.

[32] National Weather Service, *What Constitutes a Severe Thunderstorm*, https://www.weather.gov/bmx/outreach_svr, accessed June 13, 2024.

Lighting is a flash of electrical energy produced by a thunderstorm. Lightning kills approximately 50 people in the United States each year and injures hundreds.[33] Lightning can be cloud to air, cloud to cloud, or cloud to ground. Cloud to ground strikes can also be the cause of wildfires.

Santa Ana Winds

Santa Ana winds are warm, dry winds that push dry air from the inland deserts of California and the Southwest over the mountains between coastal California and the deserts. They form when high pressure builds over the desert of the Great Basin region, causing winds to blow from the east toward the Pacific Ocean and lower air pressure offshore. As air moves west from the Great Basin toward California, where pressure is lower, it gains speed as it whips through mountain valleys and passes. The resulting airflow can reach speeds upwards of 30 mph, and gusts of more than twice this speed.[34] The phenomenon occurs during the fall and early winter. Santa Ana windstorms can last for several days at a time. These hot and very dry winds dry out vegetation, increasing the fuel available to feed fires. The gusts can also fan flames and spread wildfires.

Extreme Heat

Extreme heat conditions are defined as weather that is much hotter than average for a particular time and place, and sometimes more humid. The heat index is a measure of how hot it feels when relative humidity is factored into the actual temperature. High humidity can cause the heat index to increase drastically and create dangerous health conditions.[35]

Typically, the National Weather Service (NWS) issues Excessive Heat Warning/Advisory when the heat index is predicted to be 105°F or greater for two or more consecutive days, although the temperature cut-off varies for different regions.[36] Cal-Adapt identifies an extreme heat day or warm night as a day in a year when the daily maximum/minimum temperature exceeds the 98th historical percentile of daily maximum/minimum temperatures based on the historical data from 1961-1990 between April and October. For the City of Glendora, the 98th percentile would be 100.2°F.[37] Additionally, Cal-Adapt defines a heat wave as periods of four consecutive extreme days or warm nights when the daily temperature is above the extreme heat threshold.

Power Outage

Power outages are a secondary effect of severe weather events in Glendora. During severe weather incidents, such as high winds, Southern California Edison (SCE), electricity supplier to the City, may implement an operational practice called Public Safety Power Shutoffs (PSPS), to

[33] California Governor's Office of Emergency Services, *2023 California State Hazard Mitigation Plan*, https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/2023-California-SHMP_Volume-1_11.10.2023.pdf, published August 2023, accessed June 4, 2024.
[34] California Governor's Office of Emergency Services, *2023 California State Hazard Mitigation Plan*, https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/2023-California-SHMP_Volume-1_11.10.2023.pdf, published August 2023, accessed June 4, 2024.
[35] U.S. Environmental Protection Agency, *Climate Change and Extreme Heat*, https://www.epa.gov/sites/default/files/2016-10/documents/extreme-heat-guidebook.pdf, accessed June 13, 2024.
[36] National Weather Service, *Heat Watch vs. Warning*, https://www.weather.gov/safety/heat-ww, accessed June 13, 2024.
[37] Cal-Adapt, *Extreme Heat Days & Warm Nights*, https://cal-adapt.org/tools/extreme-heat/, accessed June 13, 2024.

preemptively shut off power in high-risk areas during potentially dangerous fire conditions. This program is designed to proactively prevent electric systems from starting a wildfire when winds and temperatures are high.

Strong Santa Ana winds, high temperatures, and low humidity are all severe weather conditions that could trigger a PSPS event. The frequency of PSPS events depends on weather and environmental factors; SDG&E and SCE make decisions to implement PSPS based on internal thresholds, assessment of real-time information, and situational awareness data. If a PSPS is necessary, SCE communicates with public safety authorities, first responders, and the affected communities. Additionally, customers are notified prior to shutting off power, where conditions allow advanced notification.

When weather forecasts indicate extreme fire conditions, SCE begins predictive modeling to assess potential impacts while monitoring weather watch alerts from the National Weather Service. Leading up to an event, weather forecasts and the potential for wildfire are refined. Two days prior to extreme fire conditions forecasted, SCE would coordinate first with the local government, emergency management community, and first responders. A first notification would go out to customers 48 hours prior to the shut off, a second notification 24 hours prior, and a final notification with power shut off. It is noted that actual or sudden onset of extreme weather conditions could impact coordination and notification efforts.[38]

Outside of the PSPS events, there is the potential for power outages to occur within the City. SCE defines a major outage as a large, unexpected outage caused by either accidents or natural disasters. While uncommon, loss of electrical power is a potential secondary effect of severe weather events.

Location and Extent

A heavy rain, Santa Ana wind, or extreme heat event would occur throughout the entire City. While PSPS would only affect certain circuits within the City, a major power outage could affect the entirety of the City, including public infrastructure such as water/wastewater, transportation facilities, and emergency services. Power lines located aboveground are more likely to be impacted during an event. However, local lines are connected to regional lines which are typically located aboveground. Therefore, power outages or interruptions could occur from events not directly impacting the City.

Heavy Rains

One of the indicators for a heavy rain season is the Oceanic Niño Index (ONI), used to monitor the El Niño-Southern Oscillation (ENSO). To calculate the ONI, scientists from NOAA's Climate Prediction Center calculate the average sea surface temperature in the El Niño 3.4 region (area of the east-central equatorial Pacific Ocean) for each month, and then average it with values from

[38] Southern California Edison, *Public Safety Power Shutoffs*, https://www.sce.com/safety/wildfire/psps, accessed March 20, 2019.

the previous and following months. This running 3-month average is compared to a 30-year average. The observed difference from the average temperature in that region, whether warmer or cooler, is the ONI value for that 3-month "season." Based on the ONI, the El Niño (warm) and La Niña (cool) events in the tropical Pacific are categorized as weak, moderate, strong, or very strong.[39]



Source: Gauthier, R., Los Angeles Times, *Los Angeles prepares for rainstorms*, https://www.latimes.com/local/la-me-ln-los-angeles-rain-storms-photos-photogallery.html, accessed November 21, 2024.

Glendora experiences an average of 21.7 inches of rain per year and experiences an average of 39 days of precipitation per year.[40] Precipitation is rain, snow, sleet, or hail that is at least .01 inches on the ground. Storm drain infrastructure in the City is jointly owned and operated by the City of Glendora and the Los Angeles County Flood Control District (LACFCD). Typically, the City's drainage systems can accommodate heavy rain events, as the City and LACFCD proactively inspect, clean, and clear catch basins, flow lines, channels, and other drainage infrastructure to prevent flooding and other issues in anticipation of a storm. However, localized flooding has occurred throughout the City, particularly in low spots or where infrastructure is unable to accommodate peak flows during a storm event; refer to the Flood discussion above. In most cases, localized flooding dissipates quickly after heavy rain ceases. During heavy rain events, sandbags are utilized to prevent erosion and runoff into the public storm drain.

Santa Ana Winds

Hurricane winds are measured using the Saffir-Simpson Hurricane Wind Scale. Although hurricane events are not typical within Glendora, the scale can be used to measure strong winds that are not associated with a hurricane event. The scale uses measurements in pressure, wind speed, and damage potential to identify the types of damage associated with sustained wind events; refer to Table 4-12, *Saffir-Simpson Hurricane Wind Scale*. Depending on the severity of the wind event, any part of the City can be affected by severe winds.

[39] National Oceanic and Atmospheric Administration, *Climate Variability: Oceanic Niño Index*, https://www.climate.gov/news-features/understanding-climate/climate-variability-oceanic-nino-index, published August 30, 2009, accessed June 13, 2024.
[40] Best Places, *Glendora, CA Climate*, https://www.bestplaces.net/climate/city/ca/glendora, accessed June 14, 2024.

TABLE 4-12: SAFFIR-SIMPSON HURRICANE WIND SCALE.

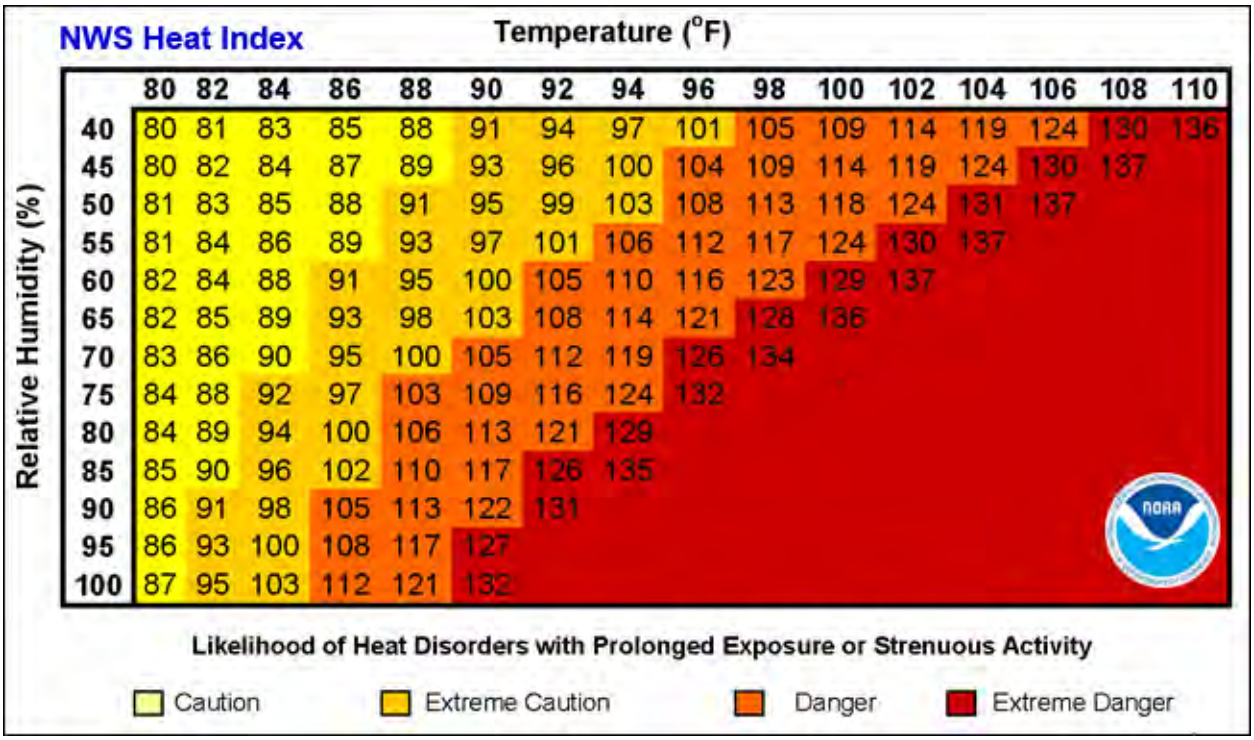
Category	Sustained Wind Speed	Description of Damages
1	74–95 mph	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96–110 mph	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3	111–129 mph	Devastating damage: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130–156 mph	Catastrophic damage: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher	Catastrophic damage: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or

Source: National Weather Service, *Saffir-Simpson Hurricane Wind Scale*, https://www.nhc.noaa.gov/aboutsshws.php, accessed June 14, 2024.

Extreme Heat

The Heat Index, which measures the "apparent temperature" when considering both air temperature and humidity, is used by the NWS to identify extreme heat days. Extreme heat is particularly dangerous when occurring for a prolonged period (heat waves). Figure 4-10, *Heat Index*, shows the likelihood of heat disorder with prolonged exposure or strenuous activity associated with various temperatures and relative humidity. As described above, the NWS indicates alert procedures when the Heat Index is expected to exceed 105°F (depending on local climate). An extreme heat event would occur throughout the City.

FIGURE 4-10: HEAT INDEX



Source: National Weather Service, *NWS Heat Index*, https://www.weather.gov/images/safety/heatindexchart-650.jpg, accessed June 14, 2024.

Power Outage

High Fire Risk Areas are areas with circuits within California Public Utilities Commission's (CPUC) Tier 2 (elevated risk) and Tier 3 (extreme risk) Fire Threat Areas. The CPUC Fire-Threat Map was developed with input from the U.S. Forest Service, California Department of Forestry and Fire Protection, and the State's investor-owned utilities, including SCE.

SCE uses their own thresholds prior to initiating a PSPS event. When evaluating weather and environmental conditions, SCE considers a variety of factors which include but are not limited to:

- National Weather Service Red Flag Warnings
- SCE meteorological assessments
- SCE Fire Potential Index
- SCE Fire Scientist assessments
- Real-time situational awareness information
- SCE Fire Management/Office of Emergency Management input
- Concerns from local or State fire authorities
- Mandatory or voluntary evacuation orders in place

- Expected impact of de-energizing circuits on essential services (including public safety agencies, water pumps, traffic controls, etc.)
- Other operational considerations to minimize wildfire ignitions

Previous Occurrences

Heavy Rains

The rainy season in Glendora traditionally occurs between November into early May; although severe rains have occurred during other times of the year when weather conditions permit. Refer to the Flood Hazard Profile for a summary of specific regional storms that caused heavy rains in the City.

Santa Ana Winds

Santa Ana winds occur annually between September to May in the City of Glendora. These events have caused tree limbs to fall and debris to scatter, at times resulting in blocked roadways and downed powerlines. Significant Santa Ana wind events in Glendora's recent history include an event in December 2011, where wind gusts of up to 80 miles per hour caused trees to fall and damage to power lines. As many as 230,000 were reported without power in the area and the City declared a state of emergency due to the severe winds, which caused an estimated $300,000 in damage.[41] Since then, there have been many records of high winds. Most incidents of high wind in the City of Glendora are the result of either the Santa Ana winds or La Niña/El Niño wind conditions.

Extreme Heat

Based on Cal Adapt's observed historical information (1961 through 2004), the City experiences four extreme heat days per year on average. [42] Over the past 20 years (2003-2023), the Santa Fe Dam monitoring station in Irwindale (located approximately 3.5 miles west of the City) has experienced an extreme heat event (101°F or higher) every year.[43] During this period, the maximum temperature during extreme heat events reached an average of 104.5°F. The southern California region experienced one of the most severe heatwaves during June 2012. During a seven-day period from June 14th to 20th, 2012, maximum daily temperatures stayed above 110°F. More recently, in 2022, California experienced a record-breaking severe heatwave. From September 1st through September 9th, 2022, temperature records for September were shattered across the western portion of the United States, including the San Gabriel Valley, where temperatures reached 111°F.

[41] Lodevico-To'o, Hazel, *Glendora City Manager Estimates $300,000 in Wind Damages*, http://glendora.patch.com/articles/glendora-city-manager-estimates-300-000-in-wind-damages, published December 7, 2011, accessed June 14, 2024.
[42] Cal-Adapt, *Extreme Heat Days & Warm Nights*, https://cal-adapt.org/tools/extreme-heat/, accessed June 13, 2024.
[43] National Oceanic and Atmospheric Administration, *Climate Data Online Search: Santa Fe Dam California*, CA US, https://www.ncei.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:USR0000CSFD/detail, accessed June 18, 2024.

Power Outage

Power outages due to severe weather events have affected parts of the City. Recent power outages include an event in January 2022 due to downed trees from Santa Ana winds;[44] and an event in December 2021, where hundreds of homes lost power due to high winds and storm conditions.[45] Recent PSPS events include a November 2023 warning for the City of Glendora and surrounding area, as a precaution because of dry conditions and strong winds that could damage power lines and potential spark wildfires.[46] Advance notice was provided to SCE customers advising that power could be off for the whole period; turned off more than once; may not begin exactly at the announced plan outage started time; and conditions may require the planned outage to be postponed. More recently, PSPS warnings and power outages affecting some areas occurred in January 2025 due to high winds and fire conditions associated with the Eaton Fire.

Probability of Future Occurrences

Heavy Rains

El Niño and La Niña are opposite phases of a natural climate pattern across the tropical Pacific Ocean that swings back and forth every 3-7 years on average.[47] Together, they are called El Niño-Southern Oscillation (ENSO). The ENSO pattern in the tropical Pacific can be in one of three states: El Niño, Neutral, or La Niña. El Niño (the warm phase) and La Niña (the cool phase) lead to significant differences from the average ocean temperatures, winds, surface pressure, and rainfall across parts of the tropical Pacific. Neutral indicates that conditions are near their long-term average.

According to the National Weather Service, ENSO conditions have returned to neutral after experiencing El Niño conditions from winter to spring 2023-24; however, La Niña conditions are projected to develop during July to September (65% chance) and persist into the Northern Hemisphere during winter 2024-25 (85% chance).[48] Typically, El Niño is associated with warm, wet winters in southern California, while La Niña is associated with cooler and drier conditions. As such, the southern California area could experience a rapid swing from heavy precipitation to dryness. However, due to the cyclical nature of these climate patterns, and based on previous occurrences and weather trends in southern California, it is anticipated that heavy rains will continue to occur in the City. The probability of future occurrences is considered highly likely.

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[44] City of Glendora, *City Updates: SCE Power Outage Map Link & Phone Number*, https://www.cityofglendora.org/Home/Components/News/News/6270/23?npage=14, accessed June 19, 2024.

[45] Fernandes, S. and Hernández, C., *LA Is Drenched. Here's How The Storm Is Impacting The Area*, https://laist.com/news/climate-environment/los-angeles-storm-what-you-need-to-know, accessed June 19, 2024.

[46] McMillan, R., *SoCal Edison warns of possible power shutoffs as powerful Santa Ana winds increase fire threat*, https://abc7.com/wind-power-shutoffs-socal-edison-fire/14029054/, accessed June 19, 2024.

[47] National Oceanic and Atmospheric Administration, *El Niño and La Niña: Frequently asked questions*, https://www.climate.gov/news-features/understanding-climate/el-ni%C3%B1o-and-la-ni%C3%B1a-frequently-asked-questions#:~:text=El%20Ni%C3%B1o%20and%20La%20Ni%C3%B1a%20are%20opposite%20phases%20of%20a,for%20El%20Ni%C3%B1o%2DSouthern%20Oscillation, accessed June 19, 2024.

[48] National Oceanic and Atmospheric Administration, *El Niño/Southern Oscillation (ENSO) Diagnostic Discussion*, https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml, published June 13, 2024, accessed June 19, 2024.

Santa Ana Winds

High winds, or Santa Ana wind events for purposes of this LHMP, have historically occurred annually within southern California and the City of Glendora. According to the National Weather Service, these winds are most common during the cooler months of the year, occurring from September to May. Due to the topography of the area, weather patterns, and annual occurrence, there is no indication that these events will not continue to occur in the future. Thus, due to their 100 percent annual occurrence, it is highly likely that high winds related to Santa Ana wind events will continue to occur in the City.



Source: LADWP, *LADWP Crews Prepared as Heavy Rain and Wind Storm Forecasted, Reminds Public to Stay Away from Downed Power Lines*, https://www.ladwpnews.com/ladwp-crews-prepared-as-heavy-rain-and-wind-storm-forecasted-reminds-public-to-stay-away-from-downed-power-lines/ accessed November 21. 2024.

Extreme Heat

Extreme heat events have historically occurred within southern California and the City. According to the National Weather Service, California has been experiencing more frequent and severe heat waves. Cal-Adapt Extreme Heat Days & Warm Nights tool indicates that for most areas of California, the climate models project a significant rise in the number of days exceeding what is now considered extremely hot for the given area. For Glendora, baseline data (1961 through 1990), shows the City experiences four extreme heat days per year on average, which is projected to increase to increase to 18 days per year on average by mid-century (2035 through 2064).[49] Thus, based on the historical occurrence of four extreme heat days per year and projected increase in future occurrences of 18 days per year, the probability that extreme heat events will continue to occur in the City is highly likely.

Power Outage

Power outage and/or PSPS events are typically associated with heavy rains, Santa Ana winds, and extreme heat. These associated events are highly likely to continue to occur in the City. Thus, based on previous occurrences and the probability of future heavy rains, Santa Ana winds, and extreme heat, power outage is highly likely to continue to occur in the City.

Climate Change Considerations

Climate change has direct effects on heavy rain events. According to research conducted by UCLA, California will experience extremely wet and extremely dry seasons by the end of the century. Climate scientists predict that “over the next 40 years, the State will be 300 to 400 percent more likely to have a prolonged storm sequence as severe as the one that caused the legendary

[49] Cal-Adapt, *Extreme Heat Days & Warm Nights*, https://cal-adapt.org/tools/extreme-heat/, accessed June 13, 2024.

California flood more than 150 years ago."[50] The Fourth Climate Change Assessment indicates the intensity of heavy precipitation events is increasing and identifies a medium-high confidence for future change. While the annual rainfall averages may remain constant, the wet season may be narrower, and precipitation is expected to fall in fewer, more extreme events.

According to the California Adaptation Planning Guide, local heat waves are likely to occur much more frequently. Climate models project a significant rise in the number of days exceeding what is normally considered extremely hot for Glendora. The number of heat waves is very likely to increase because of climate change, reflecting the global trend. According to Cal-Adapt, the number of extreme heat days in Glendora, defined as a day when the high temperature is at least 100.2°F, is expected to rise from a historical annual average of four days per year to 18 days per year by the middle of the century (2035 through 2064), and to an average of 24 days per year by the end of the century (2070 through 2099).[51] The number of warm nights in Glendora is also expected to increase, which is defined as temperatures above 68.6°F. Climate change is expected to increase the number of warm nights from a historical annual average of four nights per year to 35 warm nights per year by the middle of the century (2035 through 2064) and 49 warm nights per year by the end of the century (2070 through 2099).

SCE reports that increased power outages are directly related to climate change, and states on their website that PSPS will become "the new normal during high fire/wind events." PSPS will become increasingly required to mitigate fire risk as increased severity and duration of extreme weather events occur.

Additionally, climate change may result in storm events, Santa Ana winds, and heat waves occurring outside of traditional seasons of the year. This could increase secondary effects, such as flooding, erosion, or wildfire events.

WILDFIRE

Description

A wildfire is defined as an unplanned and unwanted wildland fire, including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fire where the object is to extinguish the fire. Wildfire is a natural part of the southern California ecosystem, helping to clear brush and debris, and is a necessary part of the various species' life cycles. Wildfires can be sparked by lightning, accidents, or arson.

Human activity has changed the buffer zone between urbanized and undeveloped areas, known as the wildland-urban interface, where naturally fire-prone landscapes abut developed neighborhoods. The natural setting of a wildland-urban interface can make these areas highly

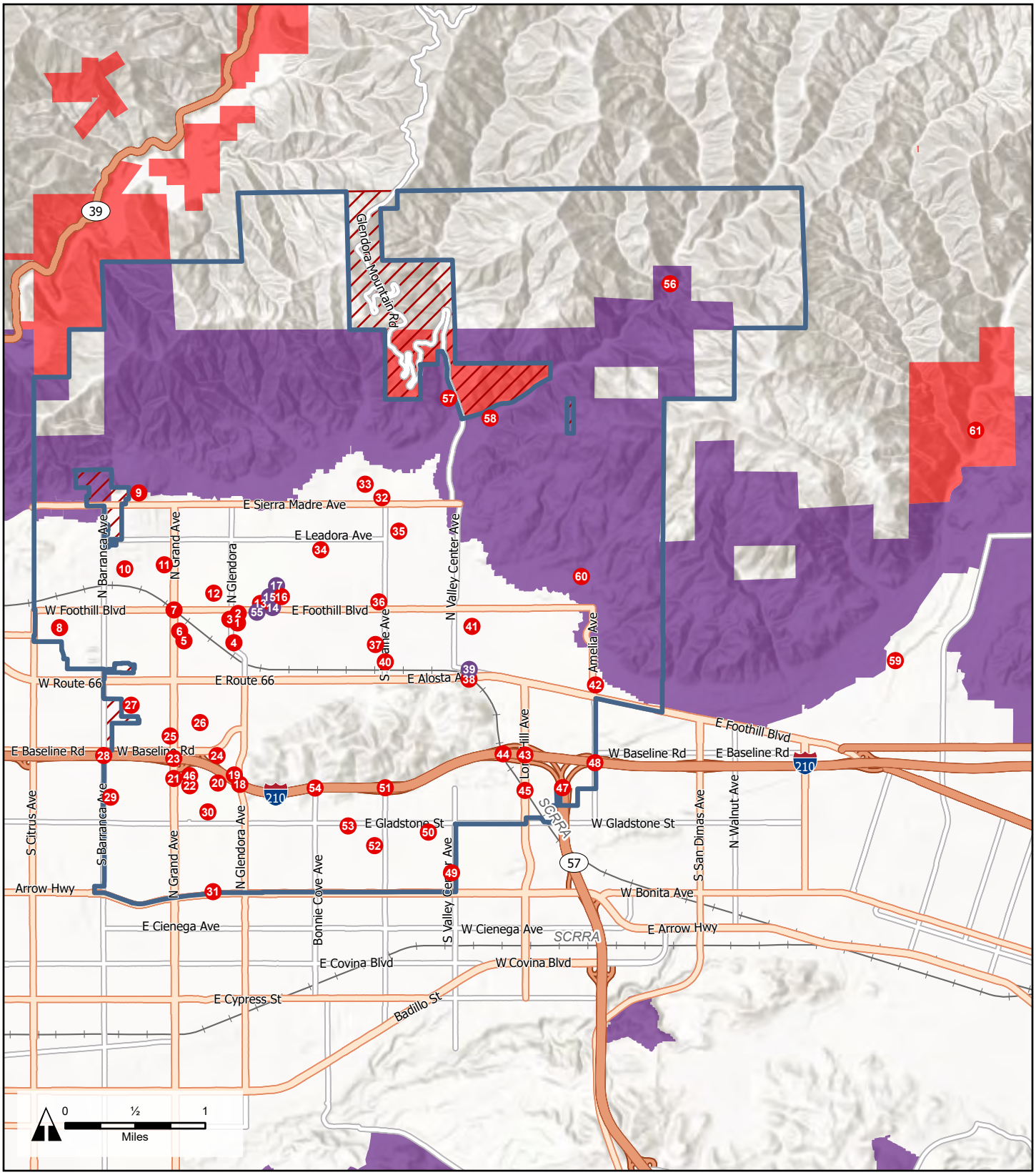
[50] Colgan, D. (UCLA), *Study forecasts a severe climate future for California*, April 2018, https://newsroom.ucla.edu/releases/california-extreme-climate-future-ucla-study, accessed June 10, 2024.
[51] Cal-Adapt, *Extreme Heat Days & Warm Nights*, https://cal-adapt.org/tools/extreme-heat/, accessed June 13, 2024.

desirable places to live, and many of these areas in California are now developed. This development has brought more people into wildfire-prone areas. The availability of fuel and increasing encroachment into the wildland-urban interface have made wildfires a common and dangerous hazard in California. Certain development patterns pose more difficult fire problems. These include multi-story, wood frame, high-density apartment developments; multi-story research developments; large continuous developed areas with combustible roofing materials; and facilities that use and/or store hazardous materials. Features of structural conditions that affect fire control include the type and use of structure, area of building, number of stories, roof covering, and exposures to the building.

Location and Extent

CAL FIRE prepares wildfire hazard severity maps including mapping areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), define the application of various mitigation strategies and influence how people construct buildings and protect property to reduce the risk associated with wildland fires. While FHSZ do not predict when or where a wildfire will occur, they do identify areas where wildfire hazards could be more severe and therefore are of greater concern. Zones are designated on varying degrees from moderate, high, and very high. A large portion of land within the City is open space and includes rugged topography with highly flammable chaparral vegetation, making wildland fires a significant risk to the community and within the City's SOI. Very High Fire Hazard Severity Zones (VHFHSZs) are in the northern and eastern foothills of the City; refer to Figure 4-11, *Fire Hazard Severity Zones*. Additionally, FHSZ are not limited to the City of Glendora. Land designed as VHFSZ is also located within the cities of Azusa and San Dimas, immediately west and east-southeast of Glendora, respectively. The Angeles National Forest is located to the north of the City and contains land designated as VHFSZ within a State Responsibility Area and land within a Federal Responsibility Area.

Fire protection challenges within Glendora occur where development is located within and directly adjacent to wildland-urban interface areas. As the number of structural features increase, so does the risk of incidence of fire. Wildfires are not measured on a specific scale and are usually classified by size or impact. The size and severity of any fire depends on the availability of fuel, weather conditions, and topography, although wildfires in the wildland-urban interface do not need to be identified as large to be damaging. Due to the location of development within and adjacent to Very High Fire Hazard Severity Zones, there is the potential for a wildfire to spread quickly and through a large portion of the City, depending on the conditions and nature of the fire.



LEGEND

- Critical Facility
- Facility of Concern
- City of Glendora
- Sphere of Influence

Fire Hazard Severity Zones in Local Responsibility Areas

- Very High

Fire Hazard Severity Zones in State Responsibility Areas

- Moderate*
- High*
- Very High

* there are no lands with this classification within the mapped extent

CITY OF GLENDORA, CALIFORNIA

Figure 4-11. Fire Hazard Severity Zones

Sources: CalFire 4-1-2024; Los Angeles County GIS. Map date: December 12, 2024.

Previous Occurrences

Fire season in southern California traditionally occurs between May and September. However, it should be noted that Glendora has experienced some of its most devastating fires during the fall (outside of the traditional fire season), including the Colby fire, as described below.

Major Wildfires in Los Angeles County History

Los Angeles County has experienced a number of major wildfires in the past, including the 1919 Ravenna and San Gabriel fires which claimed a combined 115,000 acres, and the 1970 Wright-Clampitt-Agua Dulce Fire which claimed approximately 135,000 acres.[52] Since 2005, there have been over 110 incidents burning 10 acres or more in Los Angeles County.[53] Table 4-13, *Major Wildfires in Recent Los Angeles County History*, identifies the most significant historical fires in Los Angeles County dating back to 2004 in terms of the amount of acreage claimed.

TABLE 4-13: MAJOR WILDFIRES IN RECENT LOS ANGELES COUNTY HISTORY

Name	Year	Acres Claimed
Station Fire	2009	160,577
Bobcat Fire	2020	115,796
Woolsey Fire	2018	96,949
Ranch Fire	2007	58,401
Bridge Fire	2024	56,030
Buckweed (Agua Dulce) Fire	2007	38,000
Lake Fire	2020	31,089
Powerhouse Fire	2013	30,274
Topanga Fire	2005	24,175
Creek Fire	2017	15,619
Sesnon Fire	2008	14,703
Crown Fire	2010	13,918
Sayre Fire	2008	11,262

Source: California Department of Forestry and Fire Protection, Incidents, https://www.fire.ca.gov/Incidents, accessed June 13, 2024; County of Los Angeles Fire Department, *Bobcat Fire Status*, https://fire.lacounty.gov/bobcat-fire-status/, accessed June 13, 2024.
Note: For purposes of this LHMP, major wildfires are defined as burning more than 10,000 acres in total.

Significant Historical Wildfires Near Glendora

Some of the most significant fires occurring in the vicinity of Glendora area are described below.

2009 Station Fire. The Station Fire is the 10th largest wildfire in California history, burning 160,577 acres and killing two firefighters once it began in late August 2009. The fire started in the Angeles National Forest near the U.S. Forest Service ranger station on the Angeles Crest Highway (SR 2). The blaze threatened 12,000 structures in the National Forest and the nearby communities of La Cañada Flintridge, Glendale, Acton, La Crescenta, Littlerock, Pasadena, and Altadena, as well as the Sunland and Tujunga neighborhoods of Los Angeles. The fire was predicted to burn for months and travel miles to the City of Azusa adjacent to Glendora. The

[52] Los Angeles County Fire Museum, *Timeline of Significant Dates*, https://www.lacountyfiremuseum.com/lacofd-timeline/, accessed June 13, 2024.
[53] California Department of Forestry and Fire Protection, Incidents,

Station Fire burned on the slopes of Mount Wilson, threatening numerous television, radio, and cellular antennas on the summit, as well as the Mount Wilson Observatory, which includes several historically significant telescopes and astronomical facilities operated by UCLA, USC, UC Berkeley, and Georgia State University. In October 2009, the fire extinguished due to a fall rainstorm.

2014 Colby Fire. The Colby Fire was a wildfire in the Angeles National Forest. It was ignited along the Colby Truck Trail in the San Gabriel Mountains in northern Los Angeles County. The fire started on January 16, 2014, caused by an illegal campfire that blew out of control. January fires are unusual in southern California, but there was little rainfall in the area leading up to the fire, which led to a "red flag" fire danger situation. Warm temperatures, low humidity, and an excess of dry brush in the foothills around Glendora (which had not burned significantly since the 1960s) encouraged the growth of the fire. By January 26, the Colby Fire was contained but had burned 1,992 acres. The fire, which was fanned by strong Santa Ana winds, destroyed five homes, injured one person, and forced the evacuation of 3,600 people at its peak.

2016 San Gabriel Complex Fire. The San Gabriel Complex Fire ignited the morning of June 20, 2016. The Complex Fire consisted of two fires: the Reservoir Fire and the Fish Fire. Both fires originated northeast of the city limits. The cause of the Reservoir Fire was due to a vehicle crash, while the cause of the Fish Fire is still under investigation. The fires burned fuel that was between seven and 10 years old with six- to eight-foot-tall chaparral and large grass crops. At the height of the fire, 1,376 homes were evacuated. The American Red Cross established an evacuation center and 1,460 staff from multiple local, state, and federal agencies worked to protect property and suppress the fire. Road closures were in place and law enforcement patrolled for security while firefighters worked through the night to contain the fire. Although the San Gabriel Complex Fire threatened homes in the City, no property damage was reported.

2020 Bobcat Fire. The Bobcat Fire started on September 6, 2020. By December 18, it was fully contained and had burned 115,796 acres in the central San Gabriel Mountains in the Angeles National Forest. It is one of the largest fires on record in Los Angeles County. The fire triggered mandatory evacuation orders in parts of Arcadia and Camp Williams. Forest Service investigators determined the cause of the fire was a power line conductor igniting overhead trees. The fire initially spread southward prompting evacuation orders for residents in Sierra Madre, Monrovia, Bradbury, and Duarte, along with evacuation warnings for those in Arcadia, Pasadena, and Altadena. The fire then grew westward and threatened the Mount Wilson Observatory, approaching within 500 feet of the observatory as firefighters worked to protect the structure. By September 17, the fire rapidly expanded to the north into Pleasant View Ridge Wilderness due to moderate coastal winds, leading to mandatory evacuations in Antelope Valley as the fire approached Juniper Hills. Containment difficulties were exacerbated by very dry vegetation and rugged topography that made it difficult to access. An estimated 6,000 structures were threatened and there were six injuries. The fire destroyed 27 residences and damaged 28 others. It also destroyed 83 structures and damaged 19 others.

2024 Bridge Fire. The Bridge Fire began on September 8, 2024 in the Angeles National Forest near Glendora. The fire began after a recent heat wave and fueled by dry conditions and high winds, spread to over 56,030 acres in Los Angeles and San Bernardino counties. Evacuation orders were issued in the Angeles National Forest area, including Wrightwood and Mount Baldy, and evacuation warnings were issued for the Foothill Communities, including portions of Claremont, La Verne, and San Dimas. The fire destroyed 17 structures and damaged 81 others. There were eight confirmed fire personnel and civilian injuries.



Source: Margolis, J. and Ujiiye, T., *Bridge Fire explodes to 47K acres; more than 30 homes destroyed*, https://laist.com/news/climate-environment/bridge-fire-angeles-national-forest-evacuations, accessed November 21, 2024.

2025 Eaton Fire. The Eaton Fire began on the evening of January 7, 2025 in Eaton Canyon in the San Gabriel Mountains, near Altadena. The fire was one of several major concurrent fires in the County being driven by dry conditions and extremely powerful Santa Ana winds, including the Palisades Fire and Hughes Fire. By February 20, 2025, the fire was completely contained and had burned 14,021 acres. The Eaton Fire is one of the most destructive wildfires in California history, destroying an estimated 9,414 structures, damaging 1,074 others, and resulting in 17 confirmed fatalities and nine injuries.

Probability of Future Occurrences

Wildfires have a high probability of occurring due to Glendora's location at the base of the San Gabriel Mountains, which creates a wildland-urban interface that makes the City particularly susceptible to wildfire. Los Angeles County is continually exposed to Santa Ana winds during the fall season; however, these winds can occur at other times of the year as well. Additionally, as with the recent Eaton, Bobcat, San Gabriel Complex, Colby, and Bridge fires, it is highly likely that

fires of regional significance will occur in the San Gabriel Mountains that could impact the City of Glendora. The wildland-urban interface is likely to experience wildfires in future years.

Climate Change Considerations

Several of the largest California wildfires have occurred in the past decade, including the August Complex Fire, Dixie Fire, and Mendocino Complex Fire.[54] During 2018, the Camp Fire became the deadliest wildfire in California history, killing 85 civilians and burning over 153,000 acres in Butte County.[55] Southern California experienced several severe fires in recent history, including the Eaton Fire, Palisades Fire, Bobcat Fire, Woolsey Fire, Lake Fire, and Creek Fire.

Climate change is expected to cause an increase in temperatures, as well as more frequent and intense drought conditions. The severity of a wildfire is dependent on the amount of oxygen, heat, wind, relative humidity, and fuel. Excessive heat and low humidity during the summer and fall months are likely to occur. It is possible that higher temperatures could cause local native chaparral and scrub ecosystems to change to grasslands. This would increase dry plant matter, which could cause wildfires to move more quickly or spread into developed areas of Glendora.

It is well documented that regional wildfires will likely become an increased threat, which could have secondary consequences for the City. Fires located in different parts of Los Angeles, Orange, Riverside, or San Bernardino counties can negatively impact air quality in the City. Wildfires release smoke, ash, and other particulate matter that substantially degrade air quality (including fine particulate matter, $PM_{2.5}$). $PM_{2.5}$ is particularly damaging to human health since particulate matter of this size can deeply penetrate lung tissue and affect a person's respiratory and cardiovascular systems. While poor air quality affects everyone, people with weakened immune systems or preexisting conditions, children, seniors, and people who spend a disproportionate amount of time outside are at an increased risk of wildfire smoke. The increase in wildfire frequency and size can contribute to periods of unhealthy to hazardous air quality, which leads to respiratory health impacts and worsens health impacts in persons with preexisting health conditions.

[54] California Department of Forestry and Fire Protection, *Top 20 Largest California Wildfires*, October 2022.
[55] California Department of Forestry and Fire Protection, *Camp Fire,* https://www.fire.ca.gov/incidents/2018/11/8/camp-fire/, accessed June 13, 2024.

4.3 VULNERABILITY/RISK ASSESSMENT

Vulnerability refers to a description of which assets, including structures, systems, populations, and other assets as defined by the community, within locations identified to be hazard-prone, are at risk from the effects of the identified hazards. A vulnerability analysis predicts the extent of damage to the built environment that may result from a hazard event of a given intensity in a specific area.

HISTORY OF DISASTERS AND OTHER DECLARATIONS

Federally declared disasters and other declarations affecting Los Angeles County from 2014 to 2025 are listed below in Table 4-14, *Los Angeles County FEMA Disaster Declarations (2014-2025)*. As shown, the greatest threats to the County and City include fire, severe weather, flooding, and seismic and geologic hazards such as landslide and mudslide.

TABLE 4-14: LOS ANGELES COUNTY FEMA DISASTER DECLARATIONS (2014-2025)

Disaster Number	Description	Declaration Date/ Incident Period	Assistance Provided
5051	Fire (California Colby Fire)	01-16-2014 (01-16-2014 to 01-22-2014)	N/A
5124	Fire (California Old Fire)	06-05-2016 (06-04-2016 to 06-10-2016)	Public Assistance
5129	Fire (California Fish Fire)	06-21-2016 (06-20-2016 to 06-30-2016)	Public Assistance
5132	Fire (California Sage Fire)	07-09-2016 (07-09-2016 to 07-14-2016)	Public Assistance
5135	Fire (California Sand Fire)	07-23-2016 (07-22-2016 to 08-01-2016)	Public Assistance
4305	Flood (Severe Winter Storms, Flooding, and Mudslides in California)	03-16-2017 (01-18-2017 to 01-23-2017)	Public Assistance, Risk Mitigation Assistance
5201	Fire (California la Tuna Fire)	09-02-2017 (09-01-202017 to 09-10-2017)	Public Assistance
5225	Fire (California Creek Fire)	12-05-2017 (12-05-2017 to 12-14-2017)	Public Assistance
5226	Fire (California Rye Fire)	12-05-2017 (12-05-2017 to 12-14-2017)	Public Assistance
5227	Fire (California Skirball Fire)	12-06-2017 (12-06-2017 to 12-15-2017)	Public Assistance
3396	Fire (California Wildfires)	12-08-2017 (12-04-2017 to 12-29-2017)	N/A
4353	Fire (California Wildfires, Flooding, Mudflows, and Debris Flows)	01-02-2018 (12-04-2017 to 01-31-2018)	Individual Assistance, Public Assistance, Hazard Mitigation Assistance
3409	Fire (California Wildfires)	11-09-2018 (11-08-2018 to 11-25-2018)	N/A
5280	Fire (California Woolsey Fire)	11-09-2018 (11-08-2018)	N/A
4407	Fire (California Wildfires)	11-12-2018 (11-08-2018 to 11-25-2018)	Individual Assistance, Public Assistance, Hazard Mitigation Assistance
5293	Fire (California Saddleridge Fire)	10-11-2019 (10-10-2019)	Public Assistance, Hazard Mitigation Assistance
5296	Fire (California Tick Fire)	10-24-2019 (10-24-2019)	Public Assistance
5297	Fire (California Getty Fire)	10-28-2019 (10-28-2019)	Public Assistance
3428	Biological (California Covid-19)	03-13-2020 (01-20-2020 to 05-11-2023)	Public Assistance
4482	Biological (California Covid-19 Pandemic)	03-22-2020 (01-20-2020 to 05-11-2023)	Individual Assistance, Public Assistance, Hazard Mitigation Assistance
5374	Fire (California Bobcat Fire)	09-13-2020 (09-13-2020)	N/A

Disaster Number	Description	Declaration Date/ Incident Period	Assistance Provided
4569	Fire (California Wildfires)	10-16-2020 (09-04-2020 to 11-17-2020)	Individual Assistance, Public Assistance, Hazard Mitigation Assistance
3591	Flood (California Severe Winter Storms, Flooding, and Mudslides)	01-09-2023 (01-08-2023 to 01-31-2023)	N/A
4683	Flood (California Severe Winter Storms, Flooding, Landslides, and Mudslides)	01-14-2023 (12-27-2022 to 01-31 2023)	Individual Assistance, Public Assistance, Hazard Mitigation Assistance
3592	Flood (California Severe Winter Storms, Flooding, Landslides, and Mudslides)	03-10-2023 (03-09-2023 to 07-10-2023)	N/A
4699	Severe Storm (California Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides)	04-03-2023 (02-23-2023 to 07-10-2023)	Individual Assistance, Public Assistance, Hazard Mitigation Assistance
4769	Severe Storm (California Severe Winter Storms, Tornadoes, Flooding, Landslides, and Mudslides)	04-13-2024 (01-31-2024 to 02-09-2024)	Public Assistance
5537	Fire (California Bridge Fire)	09-11-2024 (09-08-2024 to ongoing)	Public Assistance
5548	Fire (California Franklin Fire)	12-10-2024 (12-9-2024 to ongoing)	Public Assistance
5549	Fire (California Palisades Fire)	1-7-2025 (1-7-2025 to ongoing)	Public Assistance
5550	Fire (California Eaton Fire)	1-7-2025 (1-8-2025 to ongoing)	Public Assistance
5551	Fire (California Hurst Fire)	1-7-2025 (1-8-2025 to ongoing)	Public Assistance
4856	California Wildfires and Straight-line Winds	1-7-2025 (1-8-2025 to ongoing)	Individual Assistance, Public Assistance, Hazard Mitigation Assistance

Source: Federal Emergency Management Agency, *Disasters and Other Declarations*, https://www.fema.gov/disaster/declarations, accessed January 24, 2025.

State-proclaimed disasters affecting Los Angeles County from 2014 to 2025 are listed in Table 4-15, *California State Disaster Declarations for Los Angeles County (2014-2025)*. State-proclaimed disasters affecting the County and City include severe weather and wildfire.

TABLE 4-15: CALIFORNIA STATE DISASTER DECLARATIONS FOR LOS ANGELES COUNTY (2014-2025)

Disaster Code	Description	Date of Disaster
65	Severe Rainstorms	July 2015
68	Rainstorms	October 2015
71	Sand Fire	July 2016
77	January Winter Storms	January 2017
77.1	February Winter Storms	February 2017
86	La Tuna Fires	September 2017
93	Creek & Rye Fires	December 2017
108	Hill & Woolsey Fires	November 2018
109	Atmospheric River Storm System	January and February 2019
112	Eagle, Reche, Saddleridge, Sandalwood, and Wolf Fires	October 2019
113	Kincade and Tick Fires	October 2019
116	CA wildfires	September 2020
127	December Winter Storms	December 2021
135	Tropical Storm Kay	September 2022
138	Route Fire (Declared November 2022)	August 2022
140	Severe Winter Storms	December 2022 and January 2023
141	Severe Winter Storms	February 2023 and March 2023
142	Tropical Storm Hilary	August 2023
146	Severe Winter Storms	February 2024
147	Storms	March 2024
153	Bridge & Airport Fires	September 2024
157	Fires & Windstorm	January 2025

Source: California State Franchise Tax Board, *List of California Disasters*, https://www.ftb.ca.gov/file/business/deductions/disaster-codes.html, accessed January 24, 2025.

METHODOLOGY

For each of the hazards profiled in the previous section, a vulnerability/risk assessment is provided in this section. It should be noted that the actual losses will depend on the type, location, magnitude, and extent of the hazard event.

The vulnerability/risk examines three aspects of each hazard: the physical threat to critical facilities, facilities of concern, and residential and non-residential structures; the social threat to vulnerable populations, including residents and visitors to the City; and the threat to any other assets that may be affected.

This section relies primarily on the following data sources:

- U.S. Census [2017-2021 American Community Survey (ACS) 5-year estimates]
- Center for Disease Control and Prevention (CDC)/ Agency for Toxic Substances and Disease Registry (ATSDR) Social Vulnerability Index (SVI)
- California Environmental Protection Agency (CalEPA) SB 535 Disadvantaged Communities
- FEMA's National Risk Index

Census data and associated analysis/mapping conducted as part of the City's Housing Element Update were reviewed and compared to the hazards and associated mapping provided within this LHMP to provide an understanding of socially vulnerable populations that may potentially reside within an area of the City subject to hazards. This information was supplemented by the CDC/ATSDR SVI, which uses U.S. census data to determine the social vulnerability of each census tract and ranks each tract on 16 variables, in order to identify communities that may need support before, during, or after disasters. These variables are grouped into four themes that cover major areas of social vulnerability: socioeconomic status (e.g., income below 150% of poverty level, unemployed, no health insurance), household characteristics (e.g., 65 years or older, aged 17 years or younger, single parent households, English language proficiency), racial and ethnic minority status, and housing type and transportation (e.g., multi-unit structures, mobile homes, crowding, no vehicle).

FEMA's National Risk Index was reviewed in regard to the risks associated with the natural hazards with the potential to affect the City and County. FEMA's National Risk Index leverages available data for natural hazard and community risk factors to develop a baseline risk measurement at the county and census tract level. Risk refers to the potential for negative impacts as a result of a natural hazard. FEMA's National Risk Index does not include human-induced hazards. For example, a flood resulting from changes in river flows is a natural hazard, whereas flooding due to a dam failure is considered a manmade hazard, and therefore excluded from the National Risk Index.

In determining risk, FEMA's National Risk Index considers three components: a natural hazards component (expected annual loss), a consequence enhancing component (social vulnerability), and a consequence reduction component (community resilience). Expected Annual Loss represents the average economic loss in dollars resulting from natural hazards each year. It is calculated for each hazard type and quantifies loss for relevant consequence types: buildings, people, and agriculture. Social vulnerability is the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood. Community resilience is the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions

CRITICAL FACILITIES AND FACILITIES OF CONCERN

The LHMP Planning Team identified 61 critical facilities and facilities of concern for incorporation in the hazard vulnerability/risk analysis; refer to Table 4-16 and Figure 4-12, *Glendora Critical Facilities and Facilities of Concern*. Critical facilities and facilities of concern are owned, operated, and maintained by various agencies, not just the City. Critical facilities are buildings that are essential for the delivery of vital services or protection of a community. Critical facilities include emergency operation centers, healthcare facilities, police and fire stations, schools and power stations. These facilities support critical community lifelines that enable the continuous operation of critical business and government functions and are essential to human health and safety or economic security. Damage to these facilities caused by a hazard event has the potential to impair response and recovery and may lead to disruption of services. Facilities of concern are less vital to safety and well-being, but may assist in evacuations, serve as assembly points or temporary shelters, or provide a supportive role in preparing for and recovering from hazard events.

Where available, the LHMP Planning Team identified a facility's potential loss value, comprised of replacement and contents for each facility. The data was provided by the City's property insurance schedule and therefore, information for facilities not owned by the City are not shown (e.g. infrastructure, private buildings). In some instances, replacement cost information was not made available. If a facility is destroyed in a hazard event, the replacement and contents values indicate the cost to replace the entire facility and all of its contents. Typically, the cost to repair a damaged facility would be less than the replacement value. While the replacement and contents values are used throughout this plan to estimate potential losses, it is noted that the actual cost to recover from a hazard event will depend on the type and magnitude of the event.

The critical facilities were mapped in GIS and overlaid with mapped hazard areas (those hazards that have a specific geographic area) to determine which assets are located in each hazard area. Hazard areas and critical facility overlays were conducted for dam inundation, flood, seismic ground shaking, landslide (specific to seismic conditions), liquefaction, and wildfires.

Due to the nature of the hazards and availability of information, hazard overlays were not prepared for drought, landslide/mudflow, and severe weather. These hazards are not geographically defined and have the potential to affect the entire community. There are no defined hazard areas for moisture-induced landslides and mudflows, although as discussed in the hazard profile, they typically occur along hillside areas and can result from conditions caused by other hazards, such as heavy rains following wildfires. For the purposes of this LHMP, it is assumed these hazards could potentially impact the entire community, including the critical facilities.

Replacement and contents values for the facilities in each hazard area are provided to estimate the potential losses based on the method described above. However, the likelihood that all facilities are completely damaged at the same time or that the entirety of a structure and its

contents are damaged is extremely unlikely. Most impacts are anticipated to be isolated to certain locations based on the hazard.

TABLE 4-16: GLENDORA CRITICAL FACILITIES AND FACILITIES OF CONCERN

Map ID	Name	Type	Owner/ Responsible Agency	Location	Critical Facility	Facility of Concern
1	Glendora Police Facility / City Transmitter Site	Government	City of Glendora	150 S Glendora Avenue	X	
2	Glendora City Hall	Government	City of Glendora	116 E Foothill Boulevard	X	
3	Glendora Library and Cultural Center	Government	City of Glendora	140 S Glendora Avenue	X	
4	Frontier Telephone Center	Communications	Frontier	252 S Glendora Avenue	X	
5	Foothill Presbyterian Hospital	Medical	Emanate Health	250 S Grand Avenue	X	
6	Foothill Medical Arts Building	Medical	Privately Held	210 S Grand Avenue	X	
7	A Line (Gold Line) Overcrossing	Transportation Infrastructure	Los Angeles County Metropolitan Transportation Authority	Grand Avenue / Foothill Boulevard	X	
8	Citrus College	School	Citrus Community College District	1000 W Foothill Boulevard	X	
9	St. Lucy's Priory High School	School	St. Lucy's Priory	655 W Sierra Madre	X	
10	Sandburg Middle School	School	Glendora Unified School District	819 W Bennett Avenue	X	
11	La Fetra Elementary School	School	Glendora Unified School District	547 W Bennett Avenue	X	
12	LA County Fire Station #151	Government	Los Angeles County Fire Department	231 W Mountain View Avenue	X	
13	La Fetra Senior Center	Community	City of Glendora	333 E Foothill Boulevard	X	
14	City Transportation Center	Government	City of Glendora	410 E Dalton Avenue		X
15	Glendora Youth Center	Community	City of Glendora	427 E Dalton Avenue		X
16	American Legion Building	Community	City of Glendora	159 N Cullen Avenue	X	
17	Liberty House	Community	City of Glendora	181 N Cullen Avenue		X
18	I-210 Overcrossing at Glendora Ave	Transportation Infrastructure	Caltrans	I-210/ Glendora Avenue	X	
19	LA Dept of Water and Power High Voltage Transmission Lines	Electrical Infrastructure	Los Angeles Department of Water and Power	1000 S Glendora Avenue west to Grand Avenue and east to the South Hills	X	

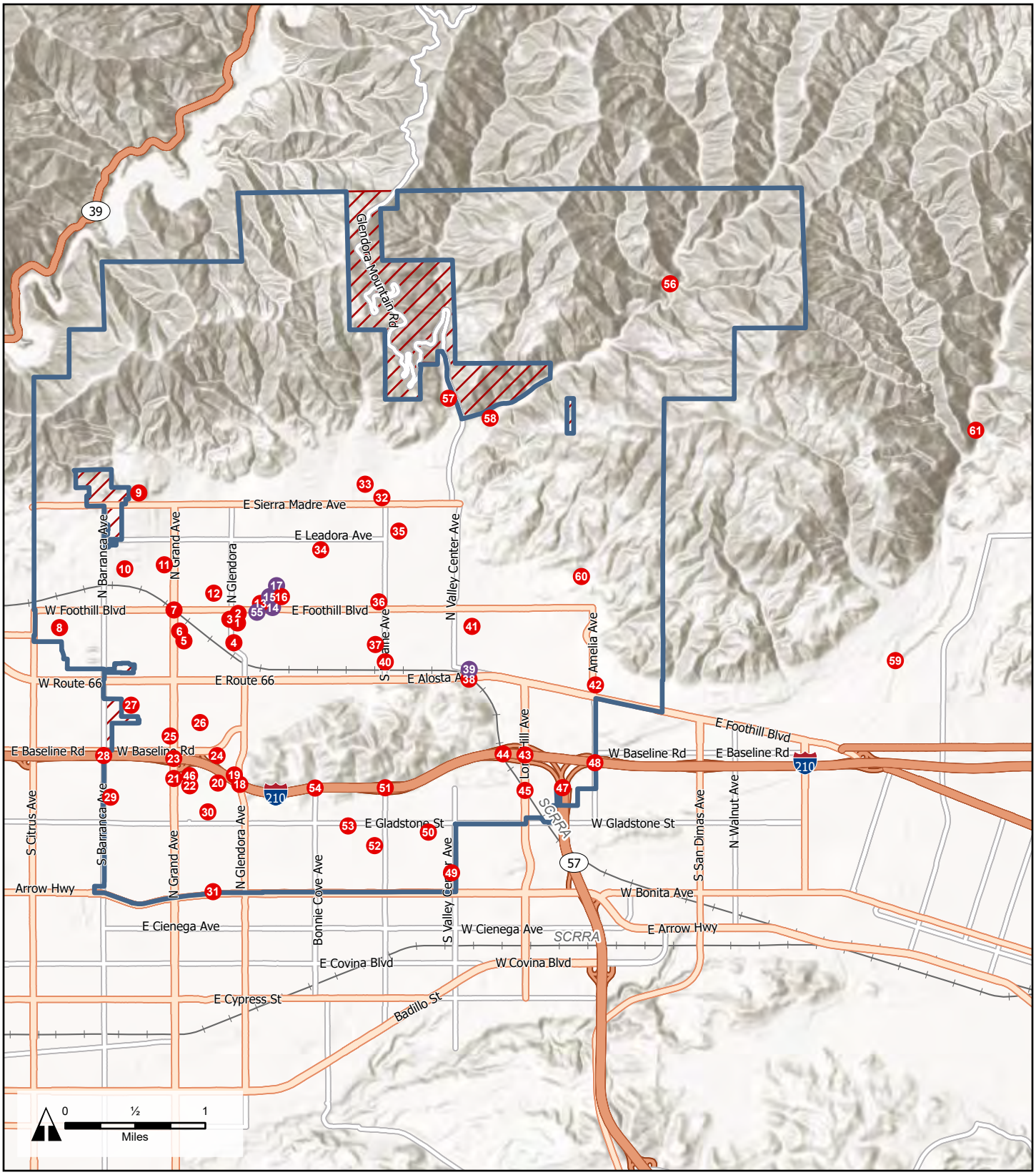
Map ID	Name	Type	Owner/ Responsible Agency	Location	Critical Facility	Facility of Concern
20	Crowther Teen Center	Community		241 W Dawson Avenue	X	
21	SCE Sub-Station	Electrical Infrastructure		Grand Ave / Citrus Edge	X	
22	LA Dept of Water and Power High Voltage Transmission Lines	Electrical Infrastructure	Los Angeles Department of Water and Power	1100 S Grand Avenue east to Glendora Avenue and west to Barranca Avenue	X	
23	I-210 Overcrossing at Grand Ave	Transportation Infrastructure	Caltrans	I-210/ Grand Avenue	X	
24	Foothill Christian School #1	School	Foothill Christian	242 W Baseline Road	X	
25	Foothill Christian School #2	School	Foothill Christian	901 S Grand Avenue	X	
26	Whitcomb High School	School	Glendora Unified School District	350 W Mauna Loa Avenue	X	
27	Stanton Elementary School	School	Glendora Unified School District	725 S Vecino Avenue	X	
28	I-210 Overcrossing at Barranca Ave	Transportation Infrastructure	Caltrans	I-210/Barranca Avenue	X	
29	LA Dept of Water and Power High Voltage Transmission Lines	Electrical Infrastructure	Los Angeles Department of Water and Power	1200 S Barranca Avenue east to Grand Avenue	X	
30	Washington Elementary School	School	Charter Oak Unified School District	325 W Gladstone Avenue	X	
31	Covina Irrigating Company	Water/Wastewater Infrastructure	Covina Irrigating Company	255 W Arrow Highway	X	
32	City of Glendora Water Yard	Water/Wastewater Infrastructure	City of Glendora	1051 E Sierra Madre Avenue	X	
33	Goddard Middle School	School	Glendora Unified School District	859 E Sierra Madre Avenue	X	
34	Cullen Elementary School	School	Glendora Unified School District	440 N Live Oak Avenue	X	
35	Glendora USD Office / Sellers Elementary School	School	Glendora Unified School District	500 N Loraine Avenue	X	
36	Hope Lutheran School	School	Hope Lutheran Church	1041 E Foothill Boulevard	X	
37	Williams Educational Center	School	Glendora Unified School District	301 S Loraine Avenue	X	

Map ID	Name	Type	Owner/ Responsible Agency	Location	Critical Facility	Facility of Concern
38	A Line (Gold Line) / Railroad Overcrossing	Transportation Infrastructure	Los Angeles County Metropolitan Transportation Authority	1400 E Route 66	X	
39	Glendora Community Service Yard	Government	City of Glendora	1626 E Compromise Line Road		X
40	Glendora City Yard	Government	City of Glendora	440 S Loraine Avenue	X	
41	Glendora High School	School	Glendora Unified School District	1600 E Foothill Boulevard	X	
42	LA County Fire Station #86	Government	Los Angeles County Fire Department	520 S Amelia Avenue	X	
43	I-210 Overcrossing at Lone Hill Ave	Transportation Infrastructure	Caltrans	I-210/Lone Hill Avenue	X	
44	I-210 Overcrossing at Railroad tracks	Transportation Infrastructure	Caltrans	I-210/Railroad Tracks (west of Lone Hill Avenue)	X	
45	A Line (Gold Line) Overcrossing at Lone Hill Ave	Transportation Infrastructure	Los Angeles County Metropolitan Transportation Authority	Lone Hill Avenue/ Railroad Tracks (south of Lone Hill Avenue/ Auto Centre Drive)	X	
46	LA Dept. of Water and Power High Voltage Transmission Lines	Electrical Infrastructure	Los Angeles Department of Water and Power	900 S Lone Hill Avenue east to Amelia Avenue and west to Pompei Park	X	
47	I-210/SR-57 Overcrossing at Auto Centre Dr	Transportation Infrastructure	Caltrans	I-210/SR-57	X	
48	I-210 Overcrossing at Amelia	Transportation Infrastructure	Caltrans	I-210/Amelia Avenue	X	
49	Water Storage Facility	Water/Wastewater Infrastructure	Cal Water	Valley Center / Plymouth	X	
50	Willow Elementary School	School	Charter Oak Unified School District	1427 S Willow Avenue	X	
51	I-210 Overcrossing at Sunflower Ave	Transportation Infrastructure	Caltrans	I-210/Sunflower Avenue	X	
52	Sunflower School	School	Charter Oak Unified School District	1505 S Sunflower Avenue	X	

Map ID	Name	Type	Owner/ Responsible Agency	Location	Critical Facility	Facility of Concern
53	LA County Fire Station #85	Government	Los Angeles County Fire Department	650 E Gladstone Street	X	
54	I-210 Overcrossing at Bonnie Cove	Transportation Infrastructure	Caltrans	I-210/Bonnie Cove	X	
55	Angeles National Forest Glendora Ranger Station	Government	U.S. Forest Service	110 N Wabash Avenue		X
56	Big Dalton	Dam	Los Angeles County Department of Public Works	2600 Big Dalton Canyon Road	X	
57	Little Dalton Debris Basin	Dam	Los Angeles County Department of Public Works	Glendora Mountain Road/Big Dalton Canyon Road	X	
58	Big Dalton Debris Basin	Dam	Los Angeles County Department of Public Works	Glendora Mountain Road/Big Dalton Canyon Road	X	
59	Puddingstone Diversion*	Dam	Los Angeles County Department of Public Works	N San Dimas Canyon Road/Terrebonne Avenue	X	
60	Morgan Debris Basin	Dam	Los Angeles County Department of Public Works	Morgan Ranch Road/Valiant Street	X	
61	San Dimas*	Dam	Los Angeles County Department of Public Works	9865 N San Dimas Canyon Road	X	

Source: City of Glendora, 2024.

Note: * These critical facilities are located outside of the Glendora Planning Area, but have dam inundation areas affecting the City.



LEGEND

- Critical Facility
- Facility of Concern
- City of Glendora
- Sphere of Influence

CITY OF GLENDORA, CALIFORNIA

Figure 4-12. Glendora Critical Facilities and Facilities of Concern

Sources: California Geological Survey Regulatory Maps Portal; Los Angeles County GIS. Map date: December 12, 2024.

VULNERABLE POPULATIONS

Factors such as age, socioeconomic status, access to key services, physical and/or mental conditions, and other factors affect the ability of people to prepare for and respond to a hazard event. Even though some hazard events may impact all parts of Glendora with equal severity, different people may experience the impacts to a greater or lesser extent. For example, lower-income households are less likely to have the financial resources to implement mitigation actions in their homes, and less likely to have the financial means to recover as a result of a hazard event. As a result, certain groups are considered to be more vulnerable to specific hazards than other groups.

This assessment includes a social threat analysis that examines how hazard events are likely to impact different populations within Glendora and where these populations live in the City. This includes assessing whether the people in an area of an elevated hazard risk are more likely than the average person to be considered a vulnerable population. The following criteria are used to assess the threat to vulnerable populations:

- Disability status: Persons with disabilities often have reduced mobility and may experience difficulties living independently. As a result, they may rely on the assistance of others to prepare for and mitigate hazard conditions.
- Income levels: Lower-income households are less likely to have the financial resources to implement mitigation activities on their residences. They may also struggle with having the necessary time to find and access educational resources discussing hazard mitigation strategies. Furthermore, lower-income households are less likely to be able to move to safer areas that are less at risk of being impacted by a hazard.
- Age: Seniors (individuals 65 years of age or older) are more likely to have reduced mobility, physical and/or mental disabilities, and lower-income levels, all of which may decrease their ability to prepare for and mitigate a hazard event. Similarly, individuals under 18 years of age may rely on the assistance of their parent(s) or guardian to prepare for and mitigate hazard conditions.
- Other variables: Other demographic and socioeconomic factors may adversely affect communities that encounter hazards. For instance, persons without access to a vehicle or non-English speakers may have greater difficulty during an evacuation event; persons without health insurance may have difficulties recovering from injuries sustained during a hazard event; and unsheltered persons are particularly vulnerable to severe weather events.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health, including natural or human-caused hazards. Reducing social vulnerability can decrease both human suffering and economic loss. The CDC SVI uses 16 variables to help local officials identify communities that may need support before, during, or after disasters. These variables are grouped into four themes that cover major areas of social vulnerability: socioeconomic status (e.g., income below 150% of poverty level, unemployed,

housing cost burden, no high school diploma, no health insurance), household characteristics (e.g., 65 years or older, aged 17 years or younger, civilian with a disability, single parent households, English language proficiency), racial and ethnic minority status, and housing type and transportation (e.g., multi-unit structures, mobile homes, crowding, no vehicle, group quarters). The CDC SVI uses Census data to determine the social vulnerability of every census tract. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes are shown in the figures below. The overall SVI map is shown in Figure 4-13; the socioeconomic SVI is shown in Figure 4-14; the household composition SVI is shown in Figure 4-15; the minority and language SVI is shown in Figure 4-16; and the housing and transportation SVI is shown in Figure 4-17.

Table 4-17, *Social Vulnerability Index*, shows the CDC's SVI percentile ranking for each census tract in the City (Statewide comparison). The percentile ranking represents the proportion of tracts that are equal to or lower than a tract of interest in terms of social vulnerability. For example, a CDC SVI ranking of 0.85 signifies that 85% of tracts in the State are less vulnerable than the tract of interest and that 15% of tracts in the State are more vulnerable. Tracts with higher SVI ranking are more likely to contain vulnerable populations.

TABLE 4-17: SOCIAL VULNERABILITY INDEX

Census Tract	Overall SVI	Socioeconomic Status	Household Characteristics	Racial/Ethnic Status	Housing Type & Transportation
4004.02	0.3657	0.448	0.0556	0.3496	0.6819
4004.04	0.0242	0.0528	0.2652	0.1424	0.0253
4005.01	0.185	0.3341	0.1597	0.1016	0.211
4008.01	0.3225	0.1692	0.2198	0.4465	0.6698
4010.01	0.1153	0.1874	0.4831	0.3753	0.0264
4010.02	0.3606	0.3167	0.147	0.3557	0.6797
4011.01	0.6844	0.4295	0.8571	0.4855	0.8436
4011.02	0.6825	0.5007	0.4796	0.4476	0.9589
4012.01	0.1533	0.074	0.5982	0.4365	0.1072
4012.02	0.3915	0.4314	0.7635	0.4507	0.1352
4012.03	0.633	0.4291	0.7069	0.5438	0.8092
4039.01	0.4479	0.4469	0.6415	0.5092	0.284
4039.02	0.5372	0.2531	0.7436	0.554	0.7589

Source: Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index 2022 database California, accessed July 17, 2024.

As shown, there are four census tracts in the City with an overall SVI that falls within the third quartile (0.5001 to 0.7500), which the CDC categorizes as having "Medium-High" level of vulnerability. These tracts are generally located in the central, south-central, and southwestern areas of the City, whereas the northern and eastern portions of the City contain lower overall SVI. The census tracts with the highest overall SVI (that are thus more likely to contain vulnerable populations) include:

- Tract 4011.01. This census tract is located in the south-central portion of the City, north of I-210, east of Glendora Avenue/Cullen Avenue, west of Loraine Avenue, and south of Foothill Boulevard. This tract is predominantly composed of single-family residential uses, with higher density and multi-family residential, commercial, and light industrial uses located generally along Route 66 and Glendora Avenue. This tract also includes a large portion of the South Hills open space area. Notable residential uses that may contain vulnerable populations include Tropics Park, Western Skies, and Alosta mobile home parks. This tract also contains the Elwood Family Apartments, an affordable housing complex restricted to low-income families; and Heritage Oaks, an affordable housing complex restricted to low-income seniors. The City of Glendora 2021-2029 Housing Element identifies this tract as one of the two census tracts in the City identified as being vulnerable to displacement.
- Tract 4011.02. This census tract is located in the central portion of the City, north of Mauna Loa Avenue, south of Foothill Boulevard, east of Grand Avenue, and generally west of Cullen Avenue. This tract contains a mix of single- and multi-family uses, commercial, and civic uses. Notable residential uses that may contain vulnerable populations include the Park Manor mobile home park and Joy's Mobile Home Park, which is restricted to seniors. Other notable uses with vulnerable populations include Glendora Hospital, Foothill Presbyterian Hospital, and Glendora Canyon Transitional Care Unit. According to U.S. Census data (2017-2021 ACS), this census tract has the highest rate of overcrowding in the City, with 9.6 percent considered overcrowded and 4.9 percent considered severely overcrowded. The City of Glendora 2021-2029 Housing Element identifies this tract as one of the two census tracts in the City identified as being vulnerable to displacement.
- Tract 4012.03. This census tract is located in the southern portion of the City, south of I-210, east of Glendora Avenue, and west of Sunflower Avenue. This tract is predominantly composed of single-family residential uses, with higher density and multi-family residential and commercial uses located generally along Arrow Highway. Notable residential uses that may contain vulnerable populations include the Glenair and Arrowhead mobile home parks.
- Tract 4039.02. This census tract is located in the southwest portion of the City, generally south of Big Dalton Wash and I-210, and west of Glendora Avenue. This tract consists mostly of single-family residential uses, but also includes commercial and multi-family residential uses, located along Gladstone Street, Grand Avenue, and Arrow Highway. Notable residential uses that may contain vulnerable populations include the Rancho Glendora and Bonita Mobile Estates mobile home parks.

While other census tracts within the City had lower overall SVI scores than the four tracts identified above, vulnerable populations may still occur. For instance, persons over the age of 65 and persons with disabilities are located throughout the City. Areas that are less likely to have significant vulnerable populations are largely concentrated in the northern and northeastern portions of the City, generally located north of Foothill Boulevard. This area is predominantly made up of single-family residential uses and open space.

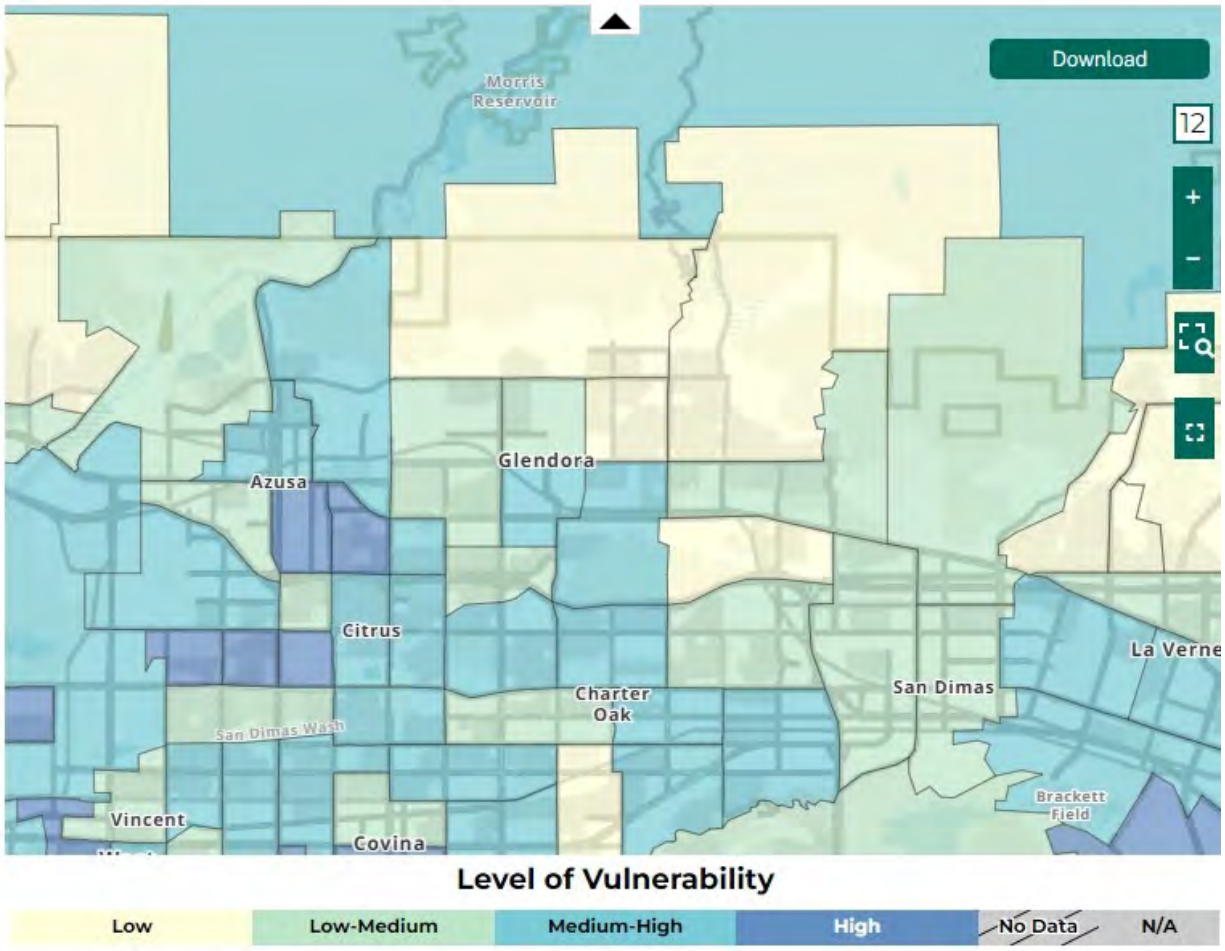
Another indicator of vulnerable populations is the California Environmental Protection Agency (CalEPA) SB 535 Disadvantaged Communities map, which shows geographic areas containing designated disadvantaged communities for the purpose of SB 535. The designation is based in part on census tracts receiving the highest 25 percent of scores according to the Office of Environmental Health Hazard Assessment's CalEnviroScreen tool, which identifies communities experiencing disproportionate amounts of pollution, environmental degradation, and socioeconomic and public health conditions. There are no disadvantaged communities in Glendora according to CalEPA's SB 535 Disadvantaged Communities map.[56]

According to the 2024 Los Angeles County Continuum of Care Point-in-Time, the City has a population of 61 unsheltered people.[57] The 2024 count shows a 32 percent decrease in persons experiencing homeless from 2022. It is assumed that the number of people experiencing homelessness in the City fluctuates and is likely to be higher than reported by the Point-in-Time count due to the often-transient nature of homeless living arrangements and other difficulties in obtaining accurate data. Conversations with local service providers indicate that while persons experiencing homelessness can occur throughout the City, higher concentrations of unsheltered persons can generally be found along flood control channels, within open space areas in the northern and eastern foothills, and within cars and RVs parked along Arrow Highway.

Overall, the data suggest that the more urbanized central, south-central, and southwestern areas of the City contain higher concentrations of vulnerable populations, likely due to the relatively higher incidence of multi-family housing, mobile home parks, and age-restricted and assisted housing developments. Areas that are less likely to have significant vulnerable populations are largely concentrated in the northern and eastern portions of the City, which are predominantly made up of single-family residential uses and open space. These northern and eastern areas of the City are developmentally constrained due to steep hillsides, endangered or protected flora and fauna, and wildfire potential. It is important to note, however, that the absence of data showing concentrations of vulnerable groups within the northern and eastern areas of the City does not mean that vulnerable populations do not exist in these areas. While it is important to identify socially vulnerable groups and develop targeted assistance programs, it is equally important to support broad-based strategies that address the community as a whole.

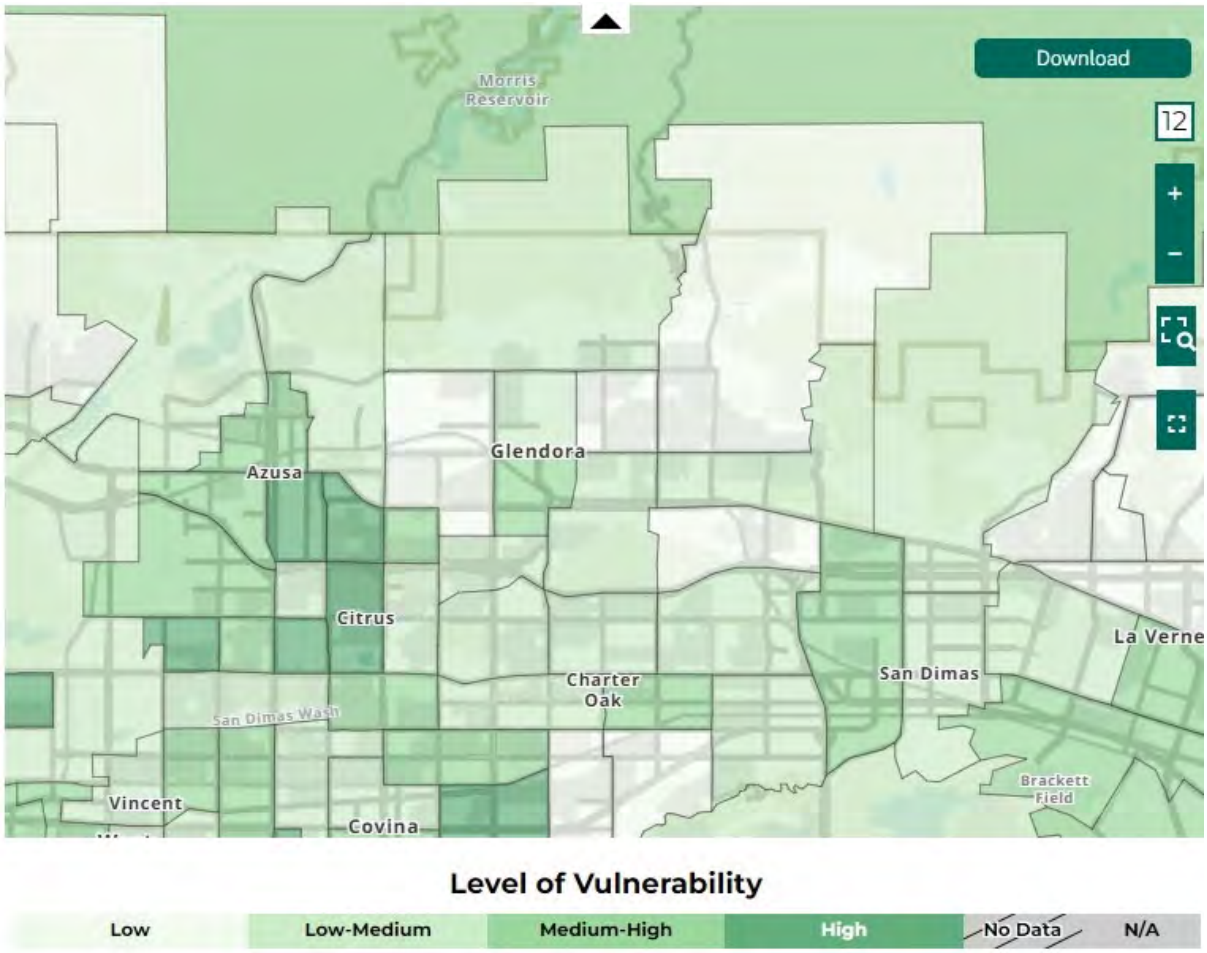
[56] California Environmental Protection Agency, *SB 535 Disadvantaged Communities (2022 Update)*, https://oehha.ca.gov/calenviroscreen/sb535, accessed July 23, 2024.
[57] Los Angeles Homeless Services Authority, *Homeless Count By City in the LA CoC*, https://www.lahsa.org/homeless-count/dashboards/hc24-localities-dashboard, accessed September 10, 2024.

FIGURE 4-13: OVERALL SVI



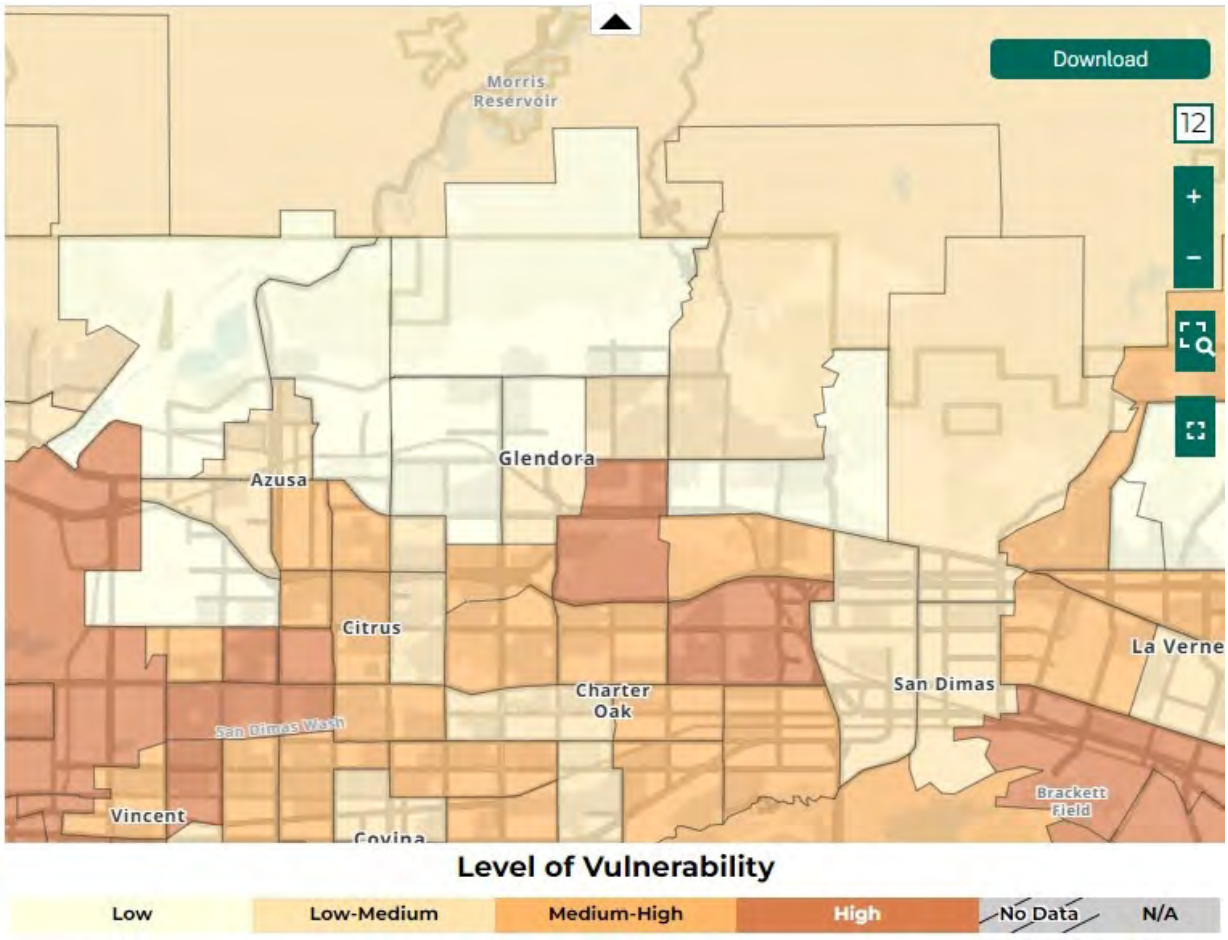
Source: Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index 2022 database California, accessed July 17, 2024.

FIGURE 4-14: SOCIOECONOMIC SVI



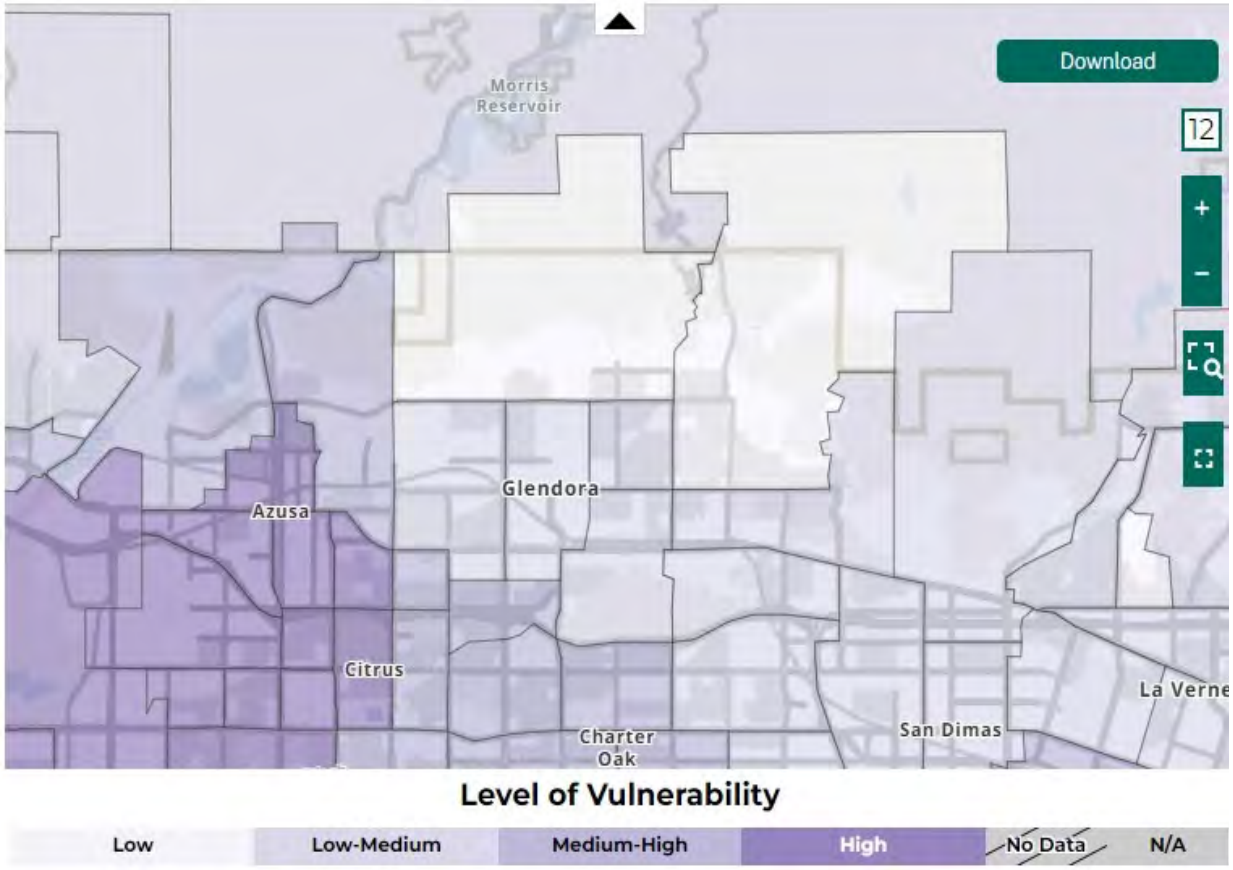
Source: Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index 2022 database California, accessed July 17, 2024.

FIGURE 4-15: HOUSEHOLD CHARACTERISTICS



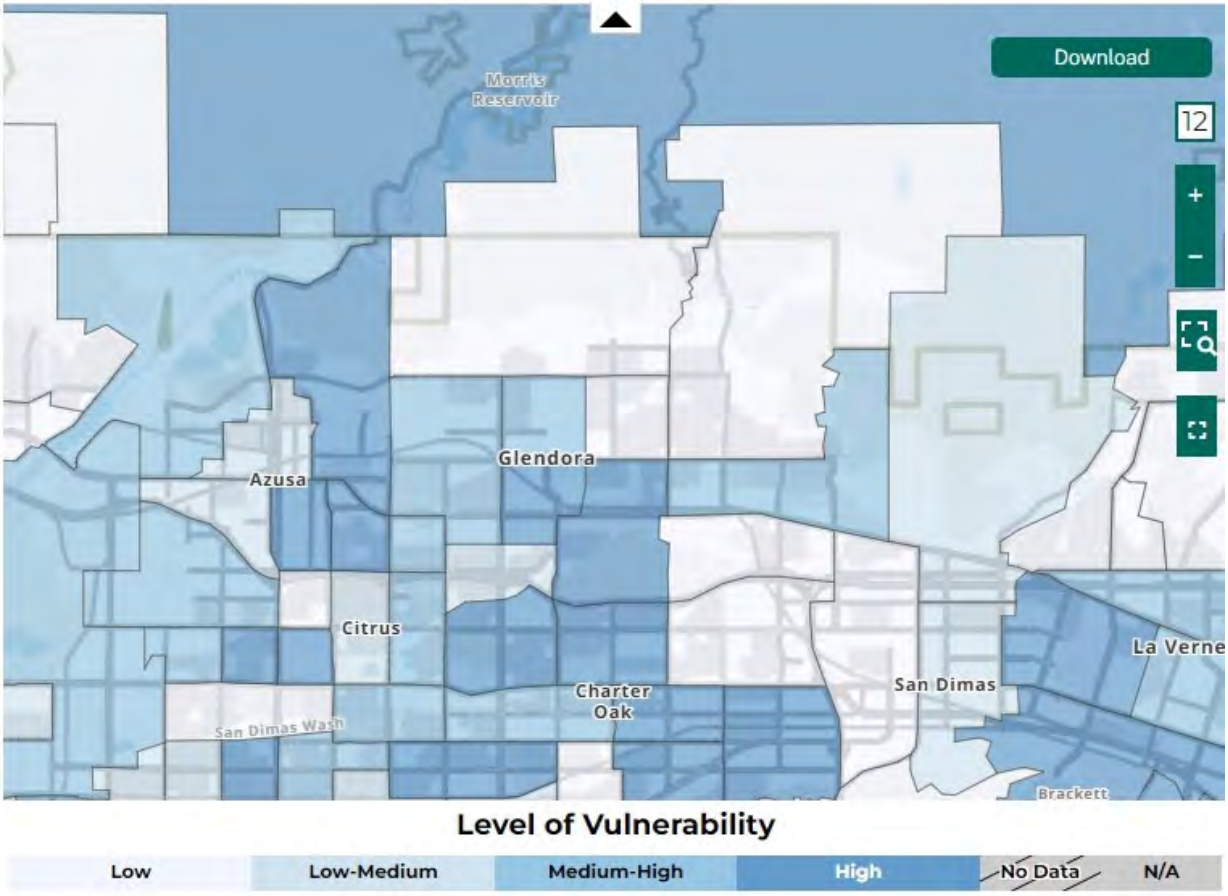
Source: Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index 2022 database California, accessed July 17, 2024.

FIGURE 4-16: RACIAL AND ETHNIC MINORITY STATUS



Source: Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index 2022 database California, accessed July 17, 2024.

FIGURE 4-17: HOUSING TYPE/TRANSPORTATION



Source: Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index 2022 database California, accessed July 17, 2024.

Other Assets

In addition to critical facilities, facilities of concern, and vulnerable populations, other assets could be affected by hazards, including services, cultural resources, or local economic activities. The vulnerability/risk assessment describes the potential harm to these other assets based on available information.

VULNERABILITY ASSESSMENT

Dam/Reservoir Failure

A significant portion of the City is located within dam inundation areas, including the central and southern areas of the City, trending in a southwesterly direction, generally between Little Dalton Wash and Big Dalton Wash, and along San Dimas Wash. As shown in Table 4-18, *Critical Facilities in a Dam Inundation Areas*, 22 critical facilities and four facilities of concern are located with dam inundation areas.

TABLE 4-18: CRITICAL FACILITIES IN A DAM INUNDATION AREAS

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
1	Glendora Police Facility / City Transmitter Site	Government	City of Glendora	$8,704,522
2	Glendora City Hall	Government	City of Glendora	$8,008,112
3	Glendora Library and Cultural Center	Government	City of Glendora	$16,011,728
13	La Fetra Senior Center	Community	City of Glendora	$6,564,780
16	American Legion Building	Community	City of Glendora	$3,059,853
23	I-210 Overcrossing at Grand Ave	Transportation Infrastructure	Caltrans	Not Available
24	Foothill Christian School #1	School	Foothill Christian	Not Available
28	I-210 Overcrossing at Barranca Ave	Transportation Infrastructure	Caltrans	Not Available
29	LA Dept of Water and Power High Voltage Transmission Lines	Electrical Infrastructure	Los Angeles Department of Water and Power	Not Available
31	Covina Irrigating Company	Water/Wastewater Infrastructure	Covina Irrigating Company	Not Available
32	City of Glendora Water Yard	Water/Wastewater Infrastructure	City of Glendora	$3,943,885
34	Cullen Elementary School	School	Glendora Unified School District	Not Available
35	Glendora USD Office / Sellers Elementary School	School	Glendora Unified School District	Not Available
38	A Line (Gold Line) / Railroad Overcrossing	Transportation Infrastructure	Los Angeles County Metropolitan Transportation Authority	Not Available
40	Glendora City Yard	Government	City of Glendora	$2,796,670

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
41	Glendora High School	School	Glendora Unified School District	Not Available
43	I-210 Overcrossing at Lone Hill Ave	Transportation Infrastructure	Caltrans	Not Available
53	LA County Fire Station #85	Government	Los Angeles County Fire Department	Not Available
56	Big Dalton	Dam	Los Angeles County Department of Public Works	Not Available
57	Little Dalton Debris Basin	Dam	Los Angeles County Department of Public Works	Not Available
58	Big Dalton Debris Basin	Dam	Los Angeles County Department of Public Works	Not Available
60	Morgan Debris Basin	Dam	Los Angeles County Department of Public Works	Not Available
Facilities of Concern				
14	City Transportation Center	Government	City of Glendora	$1,064,061
17	Liberty House	Community	City of Glendora	$333,041
39	Glendora Community Service Yard	Government	City of Glendora	$593,712
55	Angeles National Forest Glendora Ranger Station	Government	U.S. Forest Service	Not Available

The areas of the City identified as having the potential for inundation associated with a dam/reservoir failure primarily include, but are not limited to, residential, commercial, and civic uses. Major roadways within inundation areas include Sierra Madre Avenue, Foothill Boulevard, Route 66, Valley Center Avenue, Grand Avenue, Glendora Avenue, Lone Hill Avenue, and Gladstone Street. I-210 is also located within a dam inundation area but is unlikely to be affected as it is elevated above grade; on- and off-ramps connecting to I-210, however, could be impacted. A failure could damage critical facilities and infrastructure (e.g., roads, water, wastewater, electricity, natural gas), resulting in short-term interruption or extended loss of surface, loss of business income, and displacement of individuals and businesses. A catastrophic dam failure, depending on the size of the dam and the population downstream, could exceed the response capability of public safety personnel and resources, or significantly impair their ability to respond.

It is noted that Table 4-18 includes critical facilities and facilities of concern that may only be partially located within dam inundation area boundaries. For instance, some portions of the Glendora Civic Center, which houses the Glendora Police Facility, City Hall, and Library and Cultural Center (map numbers 1, 2, and 3, respectively), are subject to dam inundation at maximum flood depths of 1-2 feet, while other portions of these facilities are located outside of dam inundation areas. The primary Police Facility building is not within an inundation area, but an eastern extension of the building, which currently houses the Glendora IT Department, is subject

to maximum flood depths of 1-2 feet. Similarly, the majority of the City Hall building is not within an inundation area, but the eastern portion of the building, which currently houses the council chambers and other offices, is subject to maximum flood depths of 1-2 feet.

According to U.S. Census ACS estimates (2017-2021), the census tracts containing inundation areas have a mix of median household incomes, ranging from the lowest in the City ($66,740) to the highest in the City ($178,438). Areas of the City with lower median household incomes are generally located in the central, southern, and western portions of Glendora, which are further downstream from dams and generally have lower maximum inundation depths and a longer time of arrival than areas upstream with higher median household incomes. Inundation areas also include census tracts with a mix of percentage of population with a disability, with areas in the northeast and west generally having lower percentages of population with a disability; and a mix of percentage of renter-occupied housing units, with higher proportions of renters generally located in the central portion of the City. All census tracts within inundation areas have a low (less than five percent) percentage of population living alone; and a lower (less than ten percent) percentage of housing units experiencing overcrowding.

There is the potential that lower-income households and households experiencing housing costs as a greater percentage of their income within the City could be susceptible to cost burden with limited income and resources and may experience greater difficulties in the event they need to leave the area for an extended period of time. A dam or reservoir failure could also impact more vulnerable populations, such as senior citizens and persons with disabilities, as they may not have access to transportation to evacuate the area. Additionally, there is the potential for community members to be impacted due to damage to utility transmission lines and infrastructure outside of the immediate hazard area.

Land use and population patterns have not substantially changed within Glendora since preparation of the 2015 Natural Hazards Mitigation Plan. New development in Glendora over the last decade has been minimal; thus, vulnerabilities to land uses and populations related to dam and reservoir failure are similar. As discussed in Section 3.6, *Development Trends and Future Development*, future residential and mixed-use development is anticipated to occur primarily within the Route 66 Corridor Specific Plan, Arrow Highway Specific Plan, and other urbanized areas located in the central, southern, and western portions of the City. While it is unlikely that all anticipated growth would occur within the five-year period of this LHMP, the City anticipates some level of population growth to occur within these areas, some of which are within dam inundation areas. Residential growth is also anticipated throughout the City in the form of new accessory dwelling unit (ADUs). However, future development is not anticipated to significantly increase vulnerabilities associated with dam/reservoir failure. Future development projects would be subject to applicable federal, State, and local laws and regulations, including the latest iteration of the Building Code and City's floodplain management regulations, that would decrease vulnerability associated with dam/reservoir failure. Further, all dams with the potential to inundate parts of Glendora have received a condition assessment rating of "satisfactory" by the DSOD.

Drought

Drought conditions would affect the entire Glendora planning area; therefore, all critical facilities and facilities of concern, businesses, and residents within the City are considered vulnerable to drought hazards. Droughts do not typically result in physical damage to buildings and infrastructure, thus critical facilities and facilities of concern are not at risk of destruction or structural failure.

Prolonged drought conditions often result in stricter conservation measures, such as targeted reduction percentages or penalties for using potable water above a specific threshold. Higher rates or penalties could disproportionately impact lower-income households or residents on a fixed income. Water service providers in the City (i.e., Glendora Water Division, Suburban Water Systems, and City of Azusa Light & Water Department) are required to prepare and adopt Water Shortage Contingency Plans (WSCP) to prepare for and respond to water shortages. A water shortage, when water supply available is insufficient to meet the normally expected customer water use at a given point in time, may occur due to several reasons, such as drought, climate change, and catastrophic events. The WSCP serves as an operating manual to prevent catastrophic service disruptions through proactive, rather than reactive, management.

Vulnerabilities to drought conditions within Glendora are typically associated with drought conservation measures, which may include targeted reduction percentages and higher rates or penalties. Higher water rates or penalties could disproportionately impact lower-income households or residents on a fixed income residing within the City. Households that earn 30 percent or less than the County's median income (up to $41,600 for a family of four in 2024, based on HCD Income Limits) are considered "extremely low-income." Extremely low-income (ELI) households are more likely to contain seniors on fixed incomes, persons with disabilities, and other special-needs groups such as large families, families with female heads of households, and persons in need of emergency shelter. Within Glendora, approximately 11.7 percent of the total number of households are ELI households.[58] ELI households represent a smaller percentage of households in Glendora when compared to the County as a whole (21.0 percent of County households are ELI households). ELI households in Glendora are more likely to be renters than homeowners. Based on 2016-2020 Comprehensive Housing Affordability Strategy (CHAS) data, ELI households comprise 9.2 percent of owner-occupied households compared to 17.7 percent of renter-occupied households. ELI households are particularly susceptible to cost burden, or paying at least 30 percent of gross monthly income toward housing-related costs, reducing the ability for households to have money available for other necessities and emergency expenditures.

Some businesses, such as restaurants, can also be vulnerable to drought and water conservation measures. The City does not have a significant share of industries typically known to utilize large amounts of water, such as farming and manufacturing.

[58] U.S. Department of Housing and Urban Development, Consolidated Planning/CHAS Data 2016-2020, https://www.huduser.gov/portal/datasets/cp.html, accessed September 10, 2024.

Prolonged drought conditions can also cause impacts to the environment, resulting in dead or dried vegetation, dry soils, damage to wildlife habitat, and degradation of landscape quality. These conditions can increase the vulnerability of other hazards within the community, such as wildfires.

Minimal new development has occurred in the City since the adoption of the 2015 Natural Hazards Mitigation Plan; thus, vulnerabilities to drought related to development have remained similar over that time period. As discussed in Section 3.6, the 2021-2029 Housing Element accommodates the City's RHNA allocation of 2,276 housing units. While it is unlikely that all anticipated growth would occur within the five-year period of this LHMP, the City anticipates some level of population growth to occur, resulting in additional residential and mixed-use development. However, future growth within the City is not expected to substantially increase vulnerabilities associated with drought. New development would be required to install water efficient fixtures and landscaping pursuant to requirements of the City's Municipal Code. Additionally, water suppliers take growth projections into account when planning for future water supply and have accounted for population growth in the City. UWMPs are required to be updated every five years to ensure that adequate water supplies are available to meet existing and future water needs. As part of the UWMPs, a drought risk assessment assesses the reliability of water supplies by comparing projected future water demands with expected available water supplies under normal year, single dry year, and multiple dry year conditions. Because of the history of droughts within California, UWMPs are required to address reliability and provide for contingency plans in the event of drought or other water interruptions.

Flood

According to FEMA FIRMs, there are no mapped 100-year flood or regulatory floodways within the City. A small portion of the northwestern portion of the City, generally along Sierra Madre Avenue, is located within the 500-year floodplain. Additionally, the northern and eastern foothills of the City have not been mapped for flood hazards by FEMA. These unmapped areas generally consist of open space and low-density residential uses. There are no critical facilities or facilities of concern in Glendora located within the 100- or 500-year floodplain.

The majority of developed areas in Glendora are identified by FEMA as Zone X, meaning that the area has minimal risk of flood hazard. A relatively small number of single-family residential uses located near Sierra Madre Avenue in the western portion of the City are located within the FEMA-identified 500-year floodplain. Waterways in the City include three concreted-lined flood control channels, which are designed to manage floodwater flows. However, infrastructure and flood control facilities could be overwhelmed during a large storm event, resulting in flooding not limited to the FEMA flood zones. A significant flood resulting in damage to critical transportation facilities could interfere with the ability to evacuate specific areas of the community or to provide emergency response and equipment to an area. Similarly, localized flooding of roadways can strand motorists and hinder access to and from an area.

Residents with mobility challenges and those without access to reliable transportation may have difficulty evacuating during a flood event. Vulnerable populations with regards to flooding include seniors, persons with disabilities, and lower-income households, as these populations may experience greater mobility challenges or access limitations to personal transportation. According to U.S. Census ACS estimates (2017-2021), approximately 15.6 percent of the City's population is 65 years of age or older. While the City's median household income of $103,159 is relatively high compared to the County's median household income of $76,367, approximately 11.7 percent of the total number of households in Glendora are ELI households, meaning they earn 30 percent or less than the County's median income. Areas of Glendora with lower median incomes are concentrated in the central and southwestern areas of the City, which are correlated with a higher proportion of multi-family residential units, mobile home parks, and seniors.

Land use and population patterns have not substantially changed within the City's Planning Area since preparation of the 2015 Natural Hazards Mitigation Plan; thus, vulnerabilities to land uses and populations related to flood hazards are similar. As discussed in Section 3.0, future residential and mixed-use development is anticipated to occur primarily within the Route 66 Corridor Specific Plan, Arrow Highway Specific Plan, and other urbanized areas located in the central, southern, and western portions of the City. While it is unlikely that all anticipated growth would occur within the five-year period of this LHMP, the City anticipates some level of population growth to occur within these areas. These areas are not located within FEMA-designated flood hazard zones and future growth is not anticipated to increase vulnerabilities to flooding. Minimal residential growth is also anticipated throughout the City in the form of new ADUs, which could be built in the area of undetermined flood levels. Future development projects would be subject to applicable federal, State, and local laws and regulations, including the latest iteration of the Building Code and City's floodplain management regulations, that would decrease vulnerability associated with flood hazards.

Repetitive Loss and Severe Repetitive Loss

Addressing risk to repetitive loss and severe repetitive loss structures is an important step in reducing the financial impact of flooding as repetitive losses require extensive disaster management resources and high NFIP claims.

FEMA defines a repetitive loss as any NFIP-insured structure that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978. FEMA defines a severe repetitive loss as any NFIP-insured structure that has met one of the following paid flood loss criteria since 1978:

- Four or more separate claim payments of more than $5,000 each (Including building and contents payments); or
- Two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property.

The City of Glendora is not a participant in the NFIP since the City is located within Zone X, as identified on the FIRM. Zone X is an area of moderate or minimal hazard from the principal source of flood in the area. Glendora does not have any repetitive loss or severe repetitive loss properties.

Seismic and Geologic Hazards

The entire Glendora Planning Area is at risk of experiencing strong ground shaking as a result of an earthquake. During a seismic event, critical facilities and facilities of concern as well as residences, businesses, and infrastructure could be damaged. The extent of damage would depend upon the location and magnitude of the earthquake. Depending upon the damage, emergency services, communication systems, and utility services may all be hindered. Senior citizens and persons with disabilities that have limited mobility may be harmed if they are unable to react quickly and seek out areas of safety from falling debris. As previously stated, 15.6 percent of the City's population is 65 years of age or older. According to CHAS data, over 48 percent of all senior households had extremely low, very low, or low incomes. Approximately 10.0 percent of Glendora residents reported having one or more disabilities.

In addition to mobility limitations and the potential to be harmed during an earthquake, some populations may experience significant challenges in the event their homes are damaged and require repairs or displacement due to the extent of damages. Approximately 77.7 percent of the City's housing stock was constructed prior to 1980. Although a majority of the City's housing stock is not considered substandard or in need of rehabilitation or replacement, there is the potential for large portions of the housing stock to be susceptible to damage associated with a more significant earthquake. Additionally, approximately 11.7 percent of the total number of households in Glendora are ELI households. ELI households are particularly susceptible to cost burden, or paying at least 30 percent of gross monthly income toward housing-related costs, reducing the ability for households to have money available for other necessities and emergency expenditures, including structural repairs are relocation funding in the event their home becomes unlivable.

Further, extended interruptions in services, including power outages, would disproportionately affect people with medical conditions requiring power for medical equipment. Depending upon the extent of damage, businesses could be closed and experience economic losses.

Portions of the City are also at risk for seismic-induced landslides and liquefaction. Table 4-19, *Critical Facilities in a Landslide Zone* and Table 4-20, *Critical Facilities in a Liquefaction Zone*, identify the critical facilities located within landslide and liquefaction zones, respectively.

TABLE 4-19: CRITICAL FACILITIES IN A LANDSLIDE ZONE

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
56	Big Dalton	Dam	Los Angeles County Department of Public Works	Not Available
61	San Dimas	Dam	Los Angeles County Department of Public Works	Not Available

TABLE 4-20: CRITICAL FACILITIES IN A LIQUEFACTION ZONE

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
44	I-210 Overcrossing at Railroad tracks	Transportation Infrastructure	Caltrans	Not Available
45	A Line (Gold Line) Overcrossing at Lone Hill Ave	Transportation Infrastructure	Los Angeles County Metropolitan Transportation Authority	Not Available
47	I-210/SR-57 Overcrossing at Auto Centre Dr	Transportation Infrastructure	Caltrans	Not Available
48	I-210 Overcrossing at Amelia	Transportation Infrastructure	Caltrans	Not Available
57	Little Dalton Debris Basin	Dam	Los Angeles County Department of Public Works	Not Available
58	Big Dalton Debris Basin	Dam	Los Angeles County Department of Public Works	Not Available

Landslides can damage structures and block roadways causing long-term disruptions to the roadway network, infrastructure systems and City capabilities. Utility lines in slide-prone areas can be damaged in a landslide, causing service outages. Liquefaction can also damage buildings and infrastructure, including pipelines within soils subject to liquefaction. Damage to transportation infrastructure can impede access and hinder emergency response and evacuation. Damaged utilities can result in service interruptions or complete outages. Lower income households, those on fixed incomes, and those with mobility challenges or no access to transportation may have difficulty evacuating an area and may have more difficulty in the event of displacement.

The areas identified as having the potential for landslide susceptibility primarily occur within the northern and eastern foothills, as well as the “South Hills” located in the southern portion of the City. These areas have not been identified as having significant concentrations of socially vulnerable populations; however, socially vulnerable persons may reside in these areas. Areas with the potential for liquefaction hazards within the City primarily occur within the northern

foothills, a western portion of the City along Foothill Boulevard, and the southeastern portion of the City along I-210. These areas are shown to have households with incomes near or above the HCD State Median Income of $111,300, and a relatively high percentage of homeowners; however, between 40 and 60 percent of homeowners in these areas pay more than 30 percent of their household income on their mortgage. Thus, vulnerable populations within these areas may include low-income households experiencing housing costs as a greater percentage of their income. These households could be susceptible to cost burden with limited income and resources and may experience greater difficulties in the event they need to leave the area for an extended period in the event their residence experiences damage associated with landslide or liquefaction activity.

Minimal new development has occurred in the City since development of the 2015 Natural Hazards Mitigation Plan; thus, vulnerabilities to seismic and geologic hazards have remained similar over that time period. Construction within the City has taken geologic conditions, including landslide- and liquefaction-susceptibility into consideration. Future residential and mixed-use development is anticipated to occur primarily within the Route 66 Corridor Specific Plan, Arrow Highway Specific Plan, and other urbanized areas located in the central, southern, and western portions of the City. While it is unlikely that all anticipated growth would occur within the five-year period of this LHMP, the City anticipates some level of population growth to occur within these areas, including residential and non-residential development. However, future growth within these areas is not expected to substantially increase vulnerabilities associated with seismic and geologic hazards, as future development projects would be subject to applicable federal, State, and local laws and regulations, including the Building Code, which would reduce vulnerabilities associated with these hazards.

Severe Weather

A severe weather event, such as heavy rains, Santa Ana winds, and extreme heat conditions, could affect the entire City; therefore, all critical facilities and facilities of concern, business, and residents within the area are considered vulnerable to severe weather hazards. Heavy rain can damage structures if the roof is compromised, or drainage systems overflow and cause flooding. Landslides, slope instability, and mudflows can also occur along slopes and along creeks and channels. Flooding of roadways can also occur, stranding vehicles and limiting emergency access and response. Santa Ana wind events can damage structures, particularly from falling trees or branches or potential debris that is carried by the wind. Extreme heat events do not typically result in damage to structures. However, these events can place greater demand on the power system and result in power outages that can impact residents and businesses. Young children, the elderly, or people suffering from serious medical conditions are physiologically more vulnerable to heatstroke. People requiring the use of medical equipment with a power source could be impacted. Additionally, people experiencing homelessness are also at higher risk of health complications during an extreme heat event. Lower-income households or those with limited mobility may be unable to acquire or seek out cooling devices without significant advance preparations. This can be further compounded by the threat of Public Safety Power Shutoff

events. During these events, extreme heat impacts may affect larger portions of the City and populations that would not be viewed as vulnerable under normal circumstances.

The impact on socially vulnerable populations would be dependent upon the event and what types of facilities, services, and operations are impacted. There is the potential that if some services, such as medical, public transit, and social services are impacted to the extent that they could not operate, that the elderly, persons with disabilities, and lower-income households reliant on these services would experience significant challenges. These populations would also be more vulnerable to extreme heat events, as they may not have access to air conditioning or the financial means to provide air conditioning for extended periods of time. Some people may be required to work outside or travel via walking or public transit which could increase their exposure to the elements. Extended exposure to extreme heat could result in severe medical conditions.

As described above, 15.6 percent of the City's population is 65 years of age or older. Approximately 10.0 percent of Glendora residents reported having one or more disabilities. Households that earn 30 percent or less than the County's median income (up to $41,600 for a family of four in 2024) are considered ELI households. Within Glendora, approximately 11.7 percent of the total number of households are ELI households. ELI households are particularly susceptible to cost burden and therefore may not have the financial means or the existing resources to alleviate extreme heat conditions, or address damage that could occur from significant rain and Santa Ana wind events.

Minimal new development has occurred in the City since development of the 2015 Natural Hazards Mitigation Plan and has not exacerbated vulnerabilities related to severe weather. While it is unlikely that all anticipated growth would occur within the five-year period of this LHMP, the City anticipates some level of population growth to occur, resulting in additional residential and mixed-use development. Future growth in the City is not expected to substantially increase vulnerabilities associated with severe weather.

Wildfire

A significant portion of the City is located within a fire hazard zone. Table 4-21, *Critical Facilities in a Fire Hazard Zone*, identifies the critical facilities and facilities of concern located within fire hazard zones. These include dams/reservoirs.

TABLE 4-21: CRITICAL FACILITIES IN A FIRE HAZARD ZONE

Map #	Facility	Type	Owner/Responsible Agency	Total Loss Potential
Critical Facilities				
56	Big Dalton	Dam	Los Angeles County Department of Public Works	Not Available
57	Little Dalton Debris Basin	Dam	Los Angeles County Department of Public Works	Not Available
58	Big Dalton Debris Basin	Dam	Los Angeles County Department of Public Works	Not Available
60	Morgan Debris Basin	Dam	Los Angeles County Department of Public Works	Not Available
61	San Dimas	Dam	Los Angeles County Department of Public Works	Not Available

FHSZ areas are located in the northern and eastern foothills of the City and include single-family residential and open space uses. Wildfires can impact structures and also impact people, especially in the event of an evacuation. Seniors and persons with disabilities may have limited mobility and therefore evacuation may be a greater challenge. Persons with disabilities may require special mobility devices or caregiver assistance to evacuate. Other groups with increased threat levels include people with lower-incomes, renters, and persons experiencing homelessness. These groups may not possess enough financial resources to rebuild their homes or search for new homes in the event of evacuation or damage resulting from a wildfire.

Depending upon the location and extent of the fire, transportation routes could be impaired or inaccessible, which could impede evacuation and hinder emergency response. Evacuation and shelter areas may not be available to evacuees depending upon the location of the wildfire. Wildfires within the area, even if not within the City, can also impact people's health due to the poor air quality. Senior citizens, youth, and people with preexisting medical conditions are most at risk. Utility systems could be damaged or interrupted. Controlled and proactive power outages are highly likely during a wildfire event to reduce the risk for additional fires to be initiated. These power outages can extend beyond the area of the fire.

Similar to severe weather conditions, the impact on socially vulnerable populations within Glendora would be dependent upon the event, location, and severity. A wildfire could directly damage residences, businesses, service providers, transportation and utility infrastructure, or cause services to be impacted. Direct impacts to these facilities would greatly impact those that may not have the financial means to address the damage, cannot relocate to other areas, do not have alternative transportation options, or have medical conditions that limit their mobility and could result in greater health-related impacts. Within Glendora, this would include the elderly, persons with disabilities, and those households with lower incomes, as previously described.

Minimal new development has occurred in the City since development of the 2015 Natural Hazards Mitigation Plan. This development has occurred primarily as infill in existing urbanized areas; thus, vulnerabilities to wildfire have remained similar over that time period. Future residential and mixed-use development is anticipated to occur primarily within the Route 66 Corridor Specific Plan, Arrow Highway Specific Plan, and other urbanized areas located in the central, southern, and western portions of the City. These areas are not identified as very high or high fire hazard severity zones. Additionally, these areas are developed with existing urban uses and not located adjacent to wildland urban interface areas. While it is unlikely that all anticipated growth would occur within the five-year period of this LHMP, the City anticipates some level of population growth to occur within these areas, including residential and non-residential development. However, future growth within these areas is not expected to substantially increase vulnerabilities associated with wildfire, as future development projects would be subject to applicable federal, State, and local laws and regulations, including the Fire Code, which would reduce vulnerabilities.

Summary of Vulnerability

Overall, FEMA's National Risk Index identifies Los Angeles County as having a Risk Index rating of "Very High" when compared to the rest of the United States. The Risk Index components for the County include a rating of very high for expected annual loss; very high for social vulnerability; and very low for community resilience.

For the census tracts comprising Glendora, the Risk Index rating ranges from "Relatively Low" to "Relatively High." Expected annual losses range from "Relatively Low" to "Relatively High," with the highest losses throughout the City attributed to earthquakes and wildfire.

Table 4-22, *Risk Assessment Summary*, shows a summary of critical facilities and facilities of concern that intersect with hazard areas in the City. Those facilities that intersect with a hazard area are indicated with a "Y" and a red-shaded cell. Critical facilities and facilities of concern that do not fall within the hazard area are designated with an "N" and a green-shaded cell. The risks of drought, ground shaking, and severe weather are considered to have the potential to impact the entire community.

TABLE 4-22: RISK ASSESSMENT SUMMARY

Map ID	Name	Dam/ Reservoir Failure	Drought	Flood	Ground Shaking	Landslides	Liquefaction	Severe Weather	Wildfire
1	Glendora Police Facility / City Transmitter Site	N	Y	N	Y	N	N	Y	N
2	Glendora City Hall	N	Y	N	Y	N	N	Y	N
3	Glendora Library and Cultural Center	Y	Y	N	Y	N	N	Y	N
4	Frontier Telephone Center	N		N	Y	N	N	Y	N
5	Foothill Presbyterian Hospital	N	Y	N	Y	N	N	Y	N
6	Foothill Medical Arts Building	N	Y	N	Y	N	N	Y	N
7	A Line (Gold Line) Overcrossing	N		N	Y	N	N	Y	N
8	Citrus College	N		N	Y	N	N	Y	N
9	St. Lucy's Priory High School	N		N	Y	N	N	Y	N
10	Sandburg Middle School	N	Y	N	Y	N	N	Y	N
11	La Fetra Elementary School	N	Y	N	Y	N	N	Y	N
12	LA County Fire Station #151	N	Y	N	Y	N	N	Y	N
13	La Fetra Senior Center	Y	Y	N	Y	N	N	Y	N
14	City Transportation Center	Y	Y	N	Y	N	N	Y	N
15	Glendora Youth Center	N	Y	N	Y	N	N	Y	N
16	American Legion Building	Y	Y	N	Y	N	N	Y	N
17	Liberty House	Y	Y	N	Y	N	N	Y	N
18	I-210 Overcrossing at Glendora Ave	N	Y	N	Y	N	N	Y	N
19	LA Dept of Water and Power High Voltage Transmission Lines	N	Y	N	Y	N	N	Y	N
20	Crowther Teen Center	N	Y	N	Y	N	N	Y	N
21	SCE Sub-Station	N	Y	N	Y	N	N	Y	N
22	LA Dept of Water and Power High Voltage Transmission Lines	N	Y	N	Y	N	N	Y	N
23	I-210 Overcrossing at Grand Ave	Y	Y	N	Y	N	N	Y	N
24	Foothill Christian School #1	Y	Y	N	Y	N	N	Y	N
25	Foothill Christian School #2	N	Y	N	Y	N	N	Y	N
26	Whitcomb High School	N	Y	N	Y	N	N	Y	N
27	Stanton Elementary School	N	Y	N	Y	N	N	Y	N
28	I-210 Overcrossing at Barranca Ave	Y	Y	N	Y	N	N	Y	N
29	LA Dept of Water and Power High Voltage Transmission Lines	Y	Y	N	Y	N	N	Y	N
30	Washington Elementary School	N		N	Y	N	N	Y	N
31	Covina Irrigating Company	Y	Y	N	Y	N	N	Y	N
32	City of Glendora Water Yard	Y	Y	N	Y	N	N	Y	N
33	Goddard Middle School	N	Y	N	Y	N	N	Y	N
34	Cullen Elementary School	Y	Y	N	Y	N	N	Y	N
35	Glendora USD Office / Sellers Elementary School	Y	Y	N	Y	N	N	Y	N
36	Hope Lutheran School	N	Y	N	Y	N	N	Y	N

Map ID	Name	Dam/ Reservoir Failure	Drought	Flood	Ground Shaking	Landslides	Liquefaction	Severe Weather	Wildfire
37	Williams Educational Center	N	Y	N	Y	N	N	Y	N
38	A Line (Gold Line) / Railroad Overcrossing	Y	Y	N	Y	N	N	Y	N
39	Glendora Community Service Yard	Y	Y	N	Y	N	N	Y	N
40	Glendora City Yard	Y	Y	N	Y	N	N	Y	N
41	Glendora High School	Y	Y	N	Y	N	N	Y	N
42	LA County Fire Station #86	N	Y	N	Y	N	N	Y	N
43	I-210 Overcrossing at Lone Hill Ave	Y	Y	N	Y	N	N	Y	N
44	I-210 Overcrossing at Railroad tracks	N	Y	N	Y	N	Y	Y	N
45	A Line (Gold Line) Overcrossing at Lone Hill Ave	N	Y	N	Y	N	Y	Y	N
46	LA Dept. of Water and Power High Voltage Transmission Lines	N	Y	N	Y	N	N	Y	N
47	I-210/SR-57 Overcrossing at Auto Centre Dr	N	Y	N	Y	N	Y	Y	N
48	I-210 Overcrossing at Amelia	N	Y	N	Y	N	Y	Y	N
49	Water Storage Facility	N	Y	N	Y	N	N	Y	N
50	Willow Elementary School	N	Y	N	Y	N	N	Y	N
51	I-210 Overcrossing at Sunflower Ave	N	Y	N	Y	N	N	Y	N
52	Sunflower School	N	Y	N	Y	N	N	Y	N
53	LA County Fire Station #85	Y	Y	N	Y	N	N	Y	N
54	I-210 Overcrossing at Bonnie Cove	N	Y	N	Y	N	N	Y	N
55	Angeles National Forest Glendora Ranger Station	Y	Y	N	Y	N	N	Y	N
56	Big Dalton	Y	Y	N	Y	Y	N	Y	Y
57	Little Dalton Debris Basin	Y	Y	N	Y	N	Y	Y	Y
58	Big Dalton Debris Basin	Y	Y	N	Y	N	Y	Y	Y
59	Puddingstone Diversion*	Y	Y	N	Y	N	N	Y	N
60	Morgan Debris Basin	Y	Y	N	Y	N	N	Y	Y
61	San Dimas*	Y	Y	N	Y	Y	N	Y	Y

Note: * These critical facilities are located outside of the Glendora Planning Area but have dam inundation areas affecting the City.

Section 5.0 | Hazard Mitigation Strategy

Hazard mitigation strategies are used to reduce hazard impacts on residents, public infrastructure, and critical facilities. The hazard mitigation actions will help to protect the safety and well-being of residents and visitors, critical facilities, facilities of concern, other buildings and structures, key services, the local economy, and other important community assets. Some actions will also help with emergency preparedness, allowing for a more effective community response to hazard events. Preparedness actions are not a required component of an LHMP, but they support and complement mitigation activities, and the Planning Team chose to include them as part of the overall hazard mitigation strategy.

This section of the LHMP is derived from an in-depth review of the vulnerabilities and capabilities described in this plan. Overall, the actions represent the City's risk-based approach for reducing and/or eliminating the potential losses as identified in the Vulnerability/Risk Assessment section.

5.1 CAPABILITIES ASSESSMENT

This capabilities assessment has been designed to identify existing local agencies, personnel, planning tools, public policy and programs, technology, and funds that have the capability to support hazard mitigation activities and strategies outlined in this plan. The Planning Team collaborated to identify capabilities and mechanisms available to the City and partner agencies for reducing damage from future hazard events. After initial identification, the capabilities were reviewed again and updated in the context of developing the mitigation actions.

The capabilities assessment considered the following types of resources:

- Planning and regulatory capabilities are based on the implementation of ordinances, policies, local laws and State statutes, and plans and programs that relate to guiding and managing growth and development.
- Administrative and technical capabilities refer to the community's staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. It also refers to the ability to access and coordinate these resources effectively.
- Financial capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions.
- Education and outreach capabilities are programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Table 5-1, *Capabilities Assessment*, summarizes the capabilities assessment for Glendora.

TABLE 5-1: CAPABILITIES ASSESSMENT

Resources	Description of Ability to Support Mitigation
Planning & Regulatory	
General Plan Responsible Department: Community Development Department	The Glendora General Plan establishes the overall vision for future growth and development. As a blueprint for the future, the plan contains policies and programs designed to provide a solid basis for decisions related to land use and development. The General Plan provides the framework for the implementation of the LHMP mitigation actions. The Safety Element identifies hazards that could impact the community and establishes policy for the preparation and update of the LHMP. The City is updating the General Plan Safety Element concurrent with the LHMP and will incorporate the LHMP into its Safety Element to ensure compliance with AB 2140, making the City eligible for additional funding under the California Disaster Assistance Act (CDAA). As future General Plan Updates occur, hazard information will be updated to reflect current conditions, including updated mapping and assessments of hazards to be considered when determining the placement and development of land uses.
Zoning Ordinance Responsible Department: Community Development Department	The Glendora Zoning Ordinance implements the General Plan by establishing regulations for land use control within the City, including where and how development occurs. Zoning is used to protect the public health, safety and welfare of a community. The City can use the Zoning Ordinance to implement mitigation actions to reduce risks associated with future development. The Zoning Ordinance is incorporated into Municipal Code as Title 21.
Subdivision Ordinance Responsible Department: Community Development Department	The City's Subdivision Ordinance regulates development of housing, commercial, industrial, or other uses, including associated public infrastructure, as land is subdivided into buildable lots. The Subdivision Ordinance can ensure future subdivisions account for the risk of hazards on future development. The Subdivision Ordinance is included as Title 20 of the Municipal Code.
Building Code Responsible Department: Community Development Department	The Building Code regulates how buildings are constructed. The City adopts the State Building Code with amendments, as applicable. Mitigation actions to construct buildings to safer standards to better resist damage during a hazard event could be considered as part of future building code updates. The Building Code is incorporated as Chapter 19.02 of the Municipal Code.
Capital Improvement Program Responsible Department: Public Works Department	The Capital Improvement Program (CIP) is established to provide for the planning, funding, design, construction, maintenance and repair of City facilities and infrastructure. The CIP is a "roadmap" that provides direction and guidance to the City to carefully plan and manage its capital and infrastructure assets. Typical improvement and maintenance projects included within the CIP include streets, signals, and lighting; flood control and water quality; parks; and public facilities. The City can use the CIP to identify priority projects for hazard mitigation.
Los Angeles County Flood Control District Responsible Agency:	The Los Angeles County Flood Control District (LACFCD) was established in 1915 and provides flood risk management and water conservation to the entire County except the Antelope Valley. The LACFD Flood Maintenance Division operates and maintains dams, open channels, storm drains, debris basins, and pumping plants,

Resources	Description of Ability to Support Mitigation
County of Los Angeles, Los Angeles County Flood Control District	while the Watershed Management Division handles the National Pollutant Discharge Elimination System (NPDES) Permit Program, which controls water pollution by issuing permits to industrial, municipal, or other facilities that discharge pollutants into surface water.
Upper San Gabriel River Enhanced Watershed Management Program Responsible Agencies: County of Los Angeles, Los Angeles County Flood Control District and City of Glendora	The Upper San Gabriel River Enhanced Watershed Management Program (EWMP) fulfills the requirements of the NPDES Municipal Separate Storm Sewer System (MS4) Permit Order No. R4-2012-0175. The EWMP contains strategies, watershed control measures, and best management practices (BMPs), including multi-benefit regional projects that retain and infiltrate stormwater runoff from the 85th-percentile, 24-hour storm event for the upper portion of the San Gabriel River Watershed, to which the City contributes runoff.
Urban Water Management Plan Responsible Agencies: City of Glendora Public Works Department, Suburban Water Systems, and City of Azusa Light & Water Department	Urban Water Management Plans (UWMP) are prepared every five years. An UWMP provides long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs. The UWMP addresses drought conditions and the ability to provide water to its customers. The UWMP can be used to coordinate and implement mitigation actions associated with drought and water supply reliability.
Water Shortage Contingency Plan Responsible Agency: City of Glendora Public Works Department, Suburban Water Systems, and City of Azusa Light & Water Department	The Water Shortage Contingency Plan (WSCP) is a strategic planning document designed to prepare for and respond to water shortages. This plan is used to prevent catastrophic service disruptions through proactive, rather than reactive, management. This WSCP provides a structured guide for the District to deal with water shortages, incorporating prescriptive information and standardized action levels, along with implementation actions in the event of a catastrophic supply interruption.
Greater Los Angeles County Region Integrated Regional Water Management Plan Responsible Agencies: County of Los Angeles, Los Angeles County Flood Control District	The purpose of the Greater Los Angeles County Region Integrated Regional Water Management Plan (IRWMP) is to define a clear vision and direction for the sustainable management of water resources in the Greater Los Angeles County. The IRWMP identifies a comprehensive set of solutions to reduce the region's reliance on imported water; comply with water quality regulations by improving the quality of urban runoff, stormwater and wastewater; protect, restore and enhance natural processes and habitats; increase watershed friendly recreational space for all communities; reduce flood risk in flood prone areas by either increasing protection or decreasing needs using integrated flood management approaches; and adapt to and mitigate against climate change vulnerabilities. The IRWMP can be used to coordinate and implement mitigation actions associated with drought and water supply reliability.
Los Angeles County Water Plan Responsible Agencies: County of Los Angeles, Public Works Department	The Los Angeles County Water Plan (CWP) focuses on achieving regional water resilience through a framework of targets and strategies organized around four key focal areas: improving regional water supply reliability by better leveraging our collective local and imported water resources and infrastructure; realizing our shared groundwater management opportunities by sharing expertise and resources to overcome challenges; ensuring a consistently high standard of water service for everyone in Los Angeles County by providing regional support for small systems, with focused attention

Resources	Description of Ability to Support Mitigation
	to under-resourced communities; and mitigating the impacts of wildfire on our water supplies through coordinated efforts between land and water managers. The CWP can be used to coordinate and implement mitigation actions associated with drought and water supply reliability.
Mutual Aid Agreements Responsible Agencies: City of Glendora Police Department, City of Glendora, Los Angeles County Fire Department (LACoFD), Los Angeles County Sheriff's Department (LASD)	The City and its public safety providers maintain agreements with emergency responders to lend assistance across jurisdictional boundaries when an emergency response exceeds local resources. Access to these resources provides opportunities to implement mitigation actions to reduce damage and risk of injury during an event. It also provides for collaboration and sharing of information specific to hazards. • Fire – Federal, State, and local agreements • Police – State and local agreements • City – State and County agreements
Los Angeles County/Operational Area Emergency Operations Center Responsible Agency: County of Los Angeles	The Los Angeles County/Operational Area Emergency Operations Center (EOC) is the central coordination point that provides for multi-agency emergency coordination and support to agencies/jurisdictions within the Operational Area during an emergency or disaster. It also assists in coordination and communication between Mutual Aid Coordinators and the California Governor's Office of Emergency Services during County-wide and State-wide emergency response and recovery operations. The EOC can be used to gather and process information to and from the County, cities, school and special districts, business and industry, volunteer organizations, individuals, and State and federal government agencies. It has the ability to function as a virtual EOC so that Operational Area Members may communicate even if the primary EOC is inaccessible or otherwise unavailable. Accurate and timely communication is critical during a hazard event and can reduce more significant damage and injury. Mitigation actions specific to communications and information can be implemented through the communication systems and response efforts to reduce risk of injury and damage.
2020 County of Los Angeles All-Hazards Mitigation Plan Responsible Agencies: County of Los Angeles	The 2020 County of Los Angeles All-Hazards Mitigation Plan (AHMP) assesses risks posed by natural hazards and establishes a mitigation action plan to protect residents, critical facilities infrastructure, private property, and the environment from hazards in the unincorporated areas of the County and County-owned facilities. The AHMP ensures the County's continued eligibility for disaster relief funds from the federal and State governments.
Los Angeles County Fire Department Strategic Fire Plan Responsibly Agency: LACoFD	The LACoFD Strategic Fire Plan focuses on enhancing the protection of lives, property, and natural resources from wildland fire, as well as improving environmental resilience to wildland fires. The plan identifies and prioritizes pre-fire and post-fire management strategies and tactics meant to reduce the loss of values at risk within the operational area.
Weed Abatement Program Responsible Agencies:	The County performs weed abatement services designed to reduce fire hazards during the fire season. The weed abatement program is operated pursuant to the California Health & Safety Code sections 13879 - 14922 and Title 32 of the Los Angeles County Code, also

Resources	Description of Ability to Support Mitigation
County of Los Angeles Departments of Fire and the Agricultural Commissioner/Weights and Measures	known as the Los Angeles County Fire Code. Assessment and integration can be tailored to address localized conditions, such as drought conditions and increased wildfire threat.
Wildfire Mitigation Plan Update Responsible Agencies: Southern California Edison	Electrical corporations are required to prepare and submit Wildfire Mitigation Plans (WMPs) to the Office of Energy Infrastructure Safety for review and approval. WMPs describe how the electrical corporation is constructing, maintaining, and operating its electrical lines and equipment in a manner that will minimize the risk of catastrophic wildfire.
Administrative & Technical	
Community Development Department	The Community Development Department provides services for long-range land planning, land development, economic development, affordable housing, and transportation. Services include zoning review, building permits, dial-a-ride and affordable housing. The department is organized into the following four divisions: Building and Safey, Housing and Economic Development, Planning, and Transportation.
Building & Safety Division	The Building and Safety Division is responsible for the building and safety standards for the design, construction, use, and occupancy, of all buildings and structures within the City. The Building and Safety Division serves as a contact point for the permit and inspection process, which may involve other departments and agencies. Services include those operations relating to development, plan review, inspection, and enforcement of the adopted building codes and applicable codes within the City in order to ensure the safety of occupants and the general public.
Public Works Department	The Public Works Department is responsible for the design, construction, and maintenance of public facilities including public streets, traffic signals, storm drains, parks, and landscaping. The Public Works Department deals with mitigation actions pertaining to public facilities, maintenance of transportation systems, maintenance of local storm drain systems, and maintenance and removal of tree limbs or debris.
Finance Department	The Finance Department manages the financial operation of the City in conformity with generally accepted accounting standards and principles, and in compliance with federal and State laws. The department accounts for all City revenues and expenditures, monitors internal controls over a variety of transactions, administers water utility collections, cashiering and public counter services, payroll, accounts payable and receivable, manages several competitive grants, prepares payment of all obligations for review and approval by the City Council.
Computer Services	The MyGlendora Geographic Information System (GIS) hub is an interactive portal featuring community maps and information about programs and services offered by the City. The application is accessible on the City's website and provides the public with property specific information, including fire hazard severity zones,

Resources	Description of Ability to Support Mitigation
	fault zones, liquefaction zones, landslide zones, evacuation zones, and cooling center locations.
Glendora Police Department	The Glendora Police Department's primary mission is to enhance the safety and security of the community by providing professional, frontline law enforcement services. Services include Patrol, Community Preservation, Investigations, Traffic, Jail, as well as the K-9 Program, and Emergency Services.
Glendora Police Department; Emergency Services	Emergency Services is responsible for City-wide, local homeland security requirements, and conducts community relations presentations regarding emergency preparedness. Members who work and assist in the area of Emergency Services also may coordinate volunteer services such as Police Auxiliary members, Community Emergency Response Team (CERT), and Glendora Emergency Amateur Radio Services (GEARS).
Glendora Emergency Alert Program	The Glendora Emergency Alert system enables the City to provide community members with critical information quickly in a variety of situations, such as severe weather, unexpected road closures, missing persons, and evacuations of buildings or neighborhoods.
City of Glendora Public Works Department, Suburban Water Systems, and City of Azusa Light & Water Department	Water services in the City are provided by the City of Glendora Public Works Department, Suburban Water Systems, and City of Azusa Light & Water Department. Mitigation actions related to water conservation and hardening of critical facilities specific to water and wastewater will be implemented in coordination with these service providers.
Los Angeles County Sanitation Districts	Within the Sanitation Districts' service area, there are approximately 9,500 miles of sewers that are owned and operated by the cities and County that are tributary to the Sanitation Districts' wastewater collection system. The Sanitation Districts own, operate, and maintain approximately 1,400 miles of sewers, ranging from 8 to 144 inches in diameter, that convey approximately 500 million gallons per day of wastewater to 11 wastewater treatment plants.
Consolidated Sewer Maintenance District of Los Angeles County	The Consolidated Sewer Maintenance District of Los Angeles County (CSMD) system includes over 4,600 miles of sanitary sewers, 155 pump stations, and 4 wastewater treatment plants.
California Department of Transportation	The California Department of Transportation (Caltrans) has jurisdiction, owns, operates, and maintains several of the roadways/bridges within Glendora. Mitigation actions related to ensuring emergency transportation routes are maintained, repaired, and strengthened will require coordination and implementation by Caltrans.
Southern California Edison	Southern California Edison (SCE) provides electrical service to Glendora. These providers own and maintain electrical conveyance infrastructure. Mitigation actions specific to the provision of these services will be implemented in coordination with SCE.
Southern California Gas Company	Southern California Gas Company (SoCalGas) provides natural gas service to Glendora. SoCalGas owns and maintains natural gas conveyance infrastructure. Mitigation actions specific to the provision of these services will be implemented in coordination with the SoCalGas.
Wireless Facilities	A variety of service providers provide communication services within Glendora. Mitigation actions specific to the provision of these

Resources	Description of Ability to Support Mitigation
	services will be implemented in coordination with these service providers.
Partnering Arrangements or Intergovernmental Agreements	The Glendora Police Department and LACoFD have memorandums of understanding with other fire and law enforcement agencies to provide services in emergency events.
American Red Cross	The American Red Cross office in Arcadia serves the San Gabriel/Pomona Valley area. The Red Cross provides both technical and education/outreach support in the implementation of mitigation actions.
Financial	
Federal Emergency Management Agency	FEMA is the federal agency responsible for hazard mitigation, emergency preparedness, and emergency response and recovery activities. It provides guidance to State and local governments on hazard mitigation activities, including best practices and how to comply with federal requirements. FEMA also provides funding for hazard mitigation actions through three grant programs: Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) Grant, and Building Resilient Infrastructure and Communities (BRIC). The HMGP requires a presidential hazard declaration before funding is available; after a hazard is declared, grant applications can be submitted on a rotating basis. Both BRIC and FMA applications typically open during the fall. Outside of the Hazard Mitigation Assistance Grants, FEMA also administers Preparedness Grants and Resilience Grants that may be applicable to future City projects.
California Governor's Office of Emergency Services	Cal OES is responsible for overseeing and coordinating emergency preparedness, response, recovery and homeland security activities within California. Cal OES regularly dispatches team members to join first responders, emergency leaders and those affected by disasters that threaten public safety, to provide information essential to the public. Cal OES can assist in obtaining funding for mitigation actions identified in the plan and providing guidance on future plan updates. Additionally, Cal OES is responsible for administration and distribution of federal grant funding for the FEMA grant programs listed above.
Emergency Reserve Fund	The City maintains an emergency reserve fund for emergency needs in an amount equal to the cost to fund operations for a six-month period.
EOC Activation	When the City's EOC is activated, costs are tracked for eligible reimbursement.
Education & Outreach	
Alert LA County	Alert LA is an opt-in mass notification program utilized by the County of Los Angeles that allows individuals to receive emergency alerts by text, email and/or phone call. Alert LA County has accessibility features for people with disabilities and others with access and functional needs. This system can be used to implement mitigation actions pertaining to public outreach and dissemination of accurate and timely information during a hazard event.
Community Emergency Response Team	The Community Emergency Response Team (CERT) program was developed by the Los Angeles County Fire Department to provide basic training in safety and lifesaving skills for the general public. Upon completion of the course, CERT members can assist others in

Resources	Description of Ability to Support Mitigation
	their neighborhood or workplace following an event when professional responders are not immediately available to help. The City also offers a CERT course, at minimum annually, for its residents.
Glendora Police Auxiliary	The Glendora Police Auxiliary is group of trained, informed volunteers who could be called upon during emergency situations or in the event of a disaster. The Auxiliary may participate in Special Details which could range from appearances at community events, parades, and check-points or emergency response in times of disaster.
Glendora Police Department; Community Academy	The Community Academy is an outreach program to demystify the workings of the Glendora Police Department. Participants learn about the various duties and activities of the police department and criminal justice system.
Glendora Safe Schools	The Glendora Police Department partners with the Glendora Unified School District, the Charter Oak Unified School District, and the Azusa Unified School District to work together to maintain a safe school environment. In addition to on-site patrols and traffic enforcement, the Police Department communicates and meets regularly with school staff and committees and attends PTA meetings. The Police Department can help to implement mitigation actions through the distribution of information through these communication channels.
Neighborhood Watch Program	Neighborhood Watch is a crime prevention program which enlists the active participation of residents in cooperation with law enforcement to reduce crime in their communities. It involves neighbors getting to know each other and working together in a program of mutual assistance. Residents become trained to recognize and report suspicious activities, and can then implement crime prevention techniques such as residential and vehicle security, and personal safety into their neighborhoods.
Los Angeles County Fire Department Education and Outreach Programs	The LACoFD hosts a series of education and outreach programs including the *Ready! Set! Go!* guide, which provides residents with critical information on creating defensible space around their home, retrofitting their home with fire-resistant materials, and preparing them to safely evacuate well ahead of a wildfire; and the *Family Instructions for Rapid Escape* (F.I.R.E.) guide so families can make their homes F.I.R.E. ready and learn how to safely escape in an emergency event.
Emergency Preparedness Outreach	Disasters cannot be prevented; however, the community can reduce the effects of disasters before they occur, prepare for what could happen, and improve response and recovery. Several mitigation actions pertain to outreach and information to the community and can be implemented through a variety of programs and events in coordination with the City and other partner agencies and stakeholders.
Police/Fire Community Awareness Events	Events provide an opportunity to implement mitigation actions specific to educating and informing the community regarding hazards and ways to reduce impacts from the hazards and what to do during an emergency.

Resources	Description of Ability to Support Mitigation
Homeowner Associations	Several Homeowners Associations exist in the City of Glendora. The associations can help to implement mitigation actions through the distribution of information to their residents.
City Website, E-Newsletter, Social Media, Brochures and Pamphlets	These various forms of communication provide an opportunity to convey information and implement mitigation actions specific to educating and informing the community regarding all hazards and ways to reduce impacts from the hazards.

How can these capabilities be expanded upon and improved to reduce risk?

Several mitigation actions provide opportunities to expand upon the City's capabilities to reduce risk. Examples of these opportunities include:

Planning/Regulatory: Adopt the LHMP Update into the General Plan Safety Element (Mitigation Action 1). Monitor and update building and fire codes (Mitigation Action 32). Review information from dam inspections and Emergency Action Plans and implement physical improvements as needed (Mitigation Actions 14 and 15). Maintain flood control facilities in coordination with LACFCD (Mitigation Action 20). Perform mechanical thinning, weed abatement, and other wildfire mitigation activities to reduce wildfire risk (Mitigation Action 30 and 31). Review Wildfire Mitigation Plans prepared by the electric utility provider and coordinate opportunities to implement measures to reduce fire caused by electric infrastructure (Mitigation Action 34).

Administrative/Technical: Work with partners and vulnerable populations to identify opportunities to mitigate impacts (Mitigation Actions 9, 10, and 11). Identify organizations to assist property owners and renters with simple earthquake mitigation activities and small project-based structural improvements (Mitigation Action 22). Provide water conservation resources and strategies to reduce water usage and opportunities for cost savings (Mitigation Actions 17 and 18).

Financial: Funding resources for housing/shelter (Mitigation Action 9) and to mitigate impacts to vulnerable populations (Mitigation Action 11). Funding resources for seismic hazard mitigation activities (Mitigation Action 21, 22, and 23). Funding resources to mitigate potential damages associated with heavy rains or Santa Ana wind events (Mitigation Action 25).

Education/Outreach: Education and dissemination of information aimed at mitigating natural hazards and reducing risk (Mitigation Actions 3, 5, and 6). Education about the dangers of extreme heat, particularly to vulnerable populations (Mitigation Action 27). Outreach and education related to wildfires, including mitigation activities such as home hardening and vegetation management to address wildfire risk (Mitigation Actions 28 and 33).

5.2 HAZARD MITIGATION OVERVIEW

FEMA'S NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) provides affordable insurance to property owners, renters and businesses by encouraging communities to adopt and enforce floodplain management regulations. Participation in the NFIP is optional; however, property owners who live in a non-participating community with flood-prone areas are not able to buy flood insurance through the program. Communities with mapped floodplains cannot receive federal grants or loans for development activities in flood-prone areas and cannot receive federal disaster assistance to repair flood damaged buildings in mapped floodplains if they are not participants of the NFIP.

The City of Glendora is a participant in the NFIP and manages its flood-prone areas through Glendora Municipal Code Chapter 9.58, *Floodplain Management*, effective 2007. Chapter 9.58 applies to all areas identified as flood-prone within the jurisdiction of the City of Glendora. Pursuant to Section 9.58.060, *Compliance*, no structure or land can be constructed, located, extended, converted, or altered without full compliance with the term of this chapter and other applicable regulations.

Glendora Municipal Code Section 9.58.110, *Designation of the floodplain administrator*, appoints the Director of Public Works as the Floodplain Administrator. Pursuant to Section 9.58.120, *Duties and responsibilities of the floodplain administrator*, the floodplain administrator reviews all development permit applications to determine permit requirements have been satisfied; all other related State and federal permits have been obtained; and the site is reasonably safe from flooding. The floodplain administrator also obtains, reviews, and utilizes any base flood data available from other federal or State agency or other source. Municipal Code Section 9.58.130, *Standards of construction*, identifies the required standards of construction in all flood-prone areas, including for all new construction and substantial improvements. Other standards are addressed in Section 9.58.140, *Standards for subdivisions or other proposed new development*, and Section 9.58.150, *Standards for utilities*.

As part of the City's concurrent General Plan Safety Element update, current floodplain information has been incorporated and the goals and policies adequately respond to floodplain conditions within the City to reduce vulnerability to flood hazards. Implementation of LHMP update Mitigation Actions 1, 19, and 20 would continue to assist with compliance. Mitigation Action 1 addresses adoption of the LHMP into the City's General Plan Safety Element, including any future updates. Mitigation Action 19 encourages property owners to improve drainage on their properties through low-impact development features. Mitigation Action 20 directs the City to maintain flood control facilities, in coordination with LACFCD. Additionally, it should be noted that the City's General Plan Land Use map identifies where a specific land use is allowed within the City. The

City's Utility and Flood Control Right-of-Way (ROW) designation is applied to areas in the City that are developed for utility and flood control use.

HAZARD MITIGATION GOALS

The mitigation goals, presented in Section 1.0, serve as the basis for direction to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from hazards. The plan's goals guide the direction of future activities aimed at reducing risk and preventing loss from hazards. The goals also serve as checkpoints as agencies and organizations begin implementing mitigation action items.

The hazard mitigation actions identified below list those activities that the City will use to reduce their risk of potential hazards. These mitigation actions were identified through discussions and collaboration with the LHMP Planning Team. All the mitigation actions that were discussed have been included within the plan. Some of these actions may be eligible for funding through federal and State grant programs and other funding sources as made available to the City. The mitigation actions are intended to address the comprehensive range of identified hazards. Some actions may address risk reduction from multiple hazards.

HAZARD MITIGATION PRIORITIZATION

The Planning Team prioritized the mitigation actions using the following as guidance:

- High Priority: Top organizational priority and is generally a well-detailed project idea. Protects population, resources or properties at high risk. Uses feasible methods, techniques or technology.
- Medium Priority: A good idea that needs more information or is an action that addresses a moderate hazard.
- Low Priority: An idea that needs a lot more information or will take a lot of preliminary action to build support.

Some actions, although possibly in need of more information, were identified as a high priority due to current conditions, the risk of the hazard, and the probability of its occurrence. The Planning Team considered the frequency and severity of the hazard; the vulnerability of the community; the impacts the mitigation action would avoid or reduce; the benefits of the action on the community; the critical facilities that would benefit; the environmental benefits of the action; and the capability of the City and its partner agencies to implement the action.

The Planning Team reviewed the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria, as described in Table 5-2, *STAPLE/E Review and Selection Criteria*, when considering and prioritizing the mitigation actions. This methodology, as

endorsed by FEMA, requires that social, technical, administrative, political, legal, economic, and environmental factors are considered when reviewing potential actions.

TABLE 5-2: STAPLE/E REVIEW AND SELECTION CRITERIA

STAPLE/E Review	Selection Criteria
Social	▪ Is the proposed action socially acceptable to the jurisdiction and surrounding community? ▪ Are there equity issues involved that would mean that one segment of the jurisdiction and/or community is treated unfairly? ▪ Will the action cause social disruption?
Technical	▪ Will the proposed action work? ▪ Will it create more problems than it solves? ▪ Does it solve a problem or only a symptom? ▪ Is it the most useful action in light of other jurisdiction goals?
Administrative	▪ Can the jurisdiction implement the action? ▪ Is there someone to coordinate and lead the effort? ▪ Is there sufficient funding, staff, and technical support available? ▪ Are there ongoing administrative requirements that need to be met?
Political	▪ Is the action politically acceptable? ▪ Is there public support both to implement and to maintain the project?
Legal	▪ Is the jurisdiction authorized to implement the proposed action? ▪ Are there legal side effects? Could the activity be construed as a taking? ▪ Will the jurisdiction be liable for action or lack of action? ▪ Will the activity be challenged?
Economic	▪ What are the costs and benefits of this action? ▪ Do the benefits exceed the costs? ▪ Are initial, maintenance, and administrative costs considered? ▪ Has funding been secured for the proposed action? If not, what are the potential funding sources (public, nonprofit, and private)? ▪ How will this action affect the fiscal capability of the jurisdiction? ▪ What burden will this action place on the tax base or local economy? ▪ What are the budget and revenue effects of this activity? ▪ Does the action contribute to other jurisdiction goals? ▪ What benefits will the action provide?
Environmental	▪ How will the action affect the environment? ▪ Will the action need environmental regulatory approvals? ▪ Will it meet local and State regulatory requirements? ▪ Are endangered or threatened species likely to be affected?

HAZARD MITIGATION BENEFIT-COST REVIEW

FEMA requires local governments to analyze the benefits and costs of a range of mitigation actions that can reduce the effects of each hazard within their communities. Benefit-cost analysis is used in hazard mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit-cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now to avoid disaster-related damages later. The analysis is based on calculating the frequency and severity of a hazard, avoiding future damage, and risk.

A hazard mitigation plan must demonstrate that a process was employed which emphasized a review of benefits and costs when prioritizing the mitigation actions. The benefit-cost review must be comprehensive to the extent that it can evaluate the monetary as well as the nonmonetary benefits and costs associated with each action. The benefit-cost review should at least consider the following questions:

- How many people will benefit from the action?
- How large an area is impacted?
- How critical are the facilities that benefit from the action (e.g., which is more beneficial to protect, the fire station or the administrative building)?
- Environmentally, does it make sense to do this project for the overall community?

These questions were considered to help determine the appropriateness of mitigation actions. Those actions that did not have adequate benefits were excluded from the list of mitigation actions.

5.3 HAZARD MITIGATION ACTIONS

PREVIOUS HAZARD MITIGATION ACTIONS

The 2015 LHMP identified 27 mitigation actions. The Planning Team has reviewed the mitigation actions and documented their status.

The Planning Team considered the following in their review:

- Is the mitigation action still relevant?
- What steps/actions are you aware of that have been taken to address the specific mitigation action?

Table 5-3, *Status of Previous Plan Mitigation Actions*, provides a consolidated summary of the status of each action.

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TABLE 5-3: STATUS OF PREVIOUS PLAN HAZARD MITIGATION ACTIONS

Mitigation Reference Number	2015 Mitigation Action	Completed	Removed; No Longer Necessary or Feasible	Carried Into Plan Update	Status
Multi-Hazard #1	Integrate the goals and action items from the City of Glendora Natural Hazard Mitigation Plan into existing regulatory documents and programs, where appropriate.			X	The City implemented this mitigation action. As an ongoing opportunity, this mitigation action will be revised and carried into the plan update.
Multi-Hazard #2	Identify and pursue funding opportunities to develop and implement local and city mitigation activities.			X	This mitigation action is on-going.
Multi-Hazard #4	Identify, improve, and sustain collaborative programs focusing on the real estate and insurance industries, public and private sector organizations, and individuals to avoid activity that increases risk to natural hazards.		X		The City continues to conduct education and outreach regarding natural hazards. New mitigation actions related to education and outreach included in the plan update will supersede this mitigation action.
Multi-Hazard #5	Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in City of Glendora.			X	The City continues to do this and the mitigation action is on-going.
Multi-Hazard #6	Develop inventories of at-risk critical facilities (buildings and infrastructure).			X	The Glendora Public Works Department has a Facility Condition Assessment that is continually updated/considered to identify at-risk critical facilities. This mitigation action will be revised and carried into the plan update.
Multi-Hazard #7	Strengthen emergency services preparedness and response by linking emergency services with natural hazard mitigation programs, and enhancing public education on a regional scale.			X	The City and partner agencies continue to conduct education and outreach regarding preparedness and response. For instance, the City offers Community Emergency Response Team (CERT) basic training to residents and has hosted a Prepare Fair. This mitigation action will be carried into the plan update.
Multi-Hazard #8	Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners, businesses, and schools.			X	The City and partner agencies continue to conduct education and outreach regarding hazard mitigation. For instance, the City hosts a Prepare Fair. This mitigation action will be carried into the plan update.
Multi-Hazard #9	Review ordinances that protect natural systems and resources to mitigate for natural hazards for possible enhancements.	X			The City implemented this mitigation action. The City reviews qualifying development projects for compliance with existing ordinances, including the Model Water Efficient Landscaping Ordinance and Storm Water and Runoff Pollution Control Ordinance. Applicable projects are also subject to the California Environmental Quality Act (CEQA), which may include mitigation measures related to natural hazards.
Earthquake #1	Integrate new earthquake hazard mapping data for the City of Glendora and improve technical analysis of earthquake hazards.	X			The City implemented this mitigation action through this plan update and the General Plan Safety Element update.
Earthquake #2	Review, update, and incorporate the Evacuation Routes into appropriate planning documents.	X			The City implemented this mitigation action through the General Plan Safety Element update.
Earthquake #3	Identify funding sources for structural and nonstructural retrofitting of City-owned structures that are identified as seismically vulnerable.			X	The City continues to identify funding sources. This mitigation action will be revised and carried into the plan update.
Earthquake #4	Encourage purchase of earthquake hazard insurance.		X		The City continues to conduct education and outreach regarding seismic hazards. New mitigation actions related to education and outreach included in the plan update will supersede this mitigation action.
Earthquake #5	Encourage seismic strength evaluations of critical facilities in the City of Glendora to identify vulnerabilities for mitigation of schools and universities, public infrastructure, and critical facilities to meet current seismic standards.	X			Public Works conducts a Facility Condition Assessment that is ongoing to continue to identify at-risk critical facilities. A revised mitigation action related to critical facilities evacuations is included in the plan update and will supersede this mitigation action.
Earthquake #6	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.			X	The City and partner agencies continue to conduct education and outreach related to seismic hazards. A revised mitigation action related to critical facilities evacuations is included in the plan update and will supersede this mitigation action.

Mitigation Reference Number	2015 Mitigation Action	Completed	Removed; No Longer Necessary or Feasible	Carried Into Plan Update	Status
Flood #4	Develop a storm drain clean out program for areas prone to urban flooding.	X			LACFCD cleans and maintains a majority of the City's storm drain system. LACFCD inspects and/or cleans all catch basins annually.
Wildfire #1	Educate agency personnel on federal cost-share and grant programs, Fire Protection Agreements and other related federal programs so the full array of assistance available to local agencies is understood.		X		The City continues to educate staff on grant programs and cooperative agreements. New mitigation actions related to wildfire support programs such as funding and mutual aid included in the plan update will supersede this mitigation action.
Wildfire #2	Encourage development and dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities and to help guide emergency services during response.	X			The California Department of Forestry and Fire Protection (CAL FIRE) prepares and periodically updates wildfire hazard severity maps. The City reviews development projects within designated fire hazard severity zones and continues to conduct education and outreach regarding wildfire hazards. A revised mitigation action related to wildfire hazards education and outreach is included in the plan update and will supersede this mitigation action.
Wildfire #3	Enhance outreach and education programs aimed at mitigating wildfire hazards and reducing or preventing the exposure of citizens, public agencies, private property owners and businesses to natural hazards.			X	The City and partner agencies continue to conduct education and outreach related to wildfire hazards. This mitigation action will be carried into the plan update.
Wildfire #4	Increase communication, coordination and collaboration between wildland/urban interface property owners, local and county planners and fire prevention crews and officials to address risks, existing mitigation measures and federal assistance programs.			X	The City reviews development projects within designated fire hazard severity zones and continues to conduct education and outreach regarding wildfire hazards. New development is required to comply with existing regulations to reduce wildfire risk, including the Fire Code. This mitigation action will be carried into the plan update.
Wildfire #5	Encourage implementation of wildfire mitigation activities.			X	Mechanical thinning is regularly conducted as required by law in areas of the City's responsibility. This mitigation action will be revised and carried into the plan update.
Wildfire #6	Clear trimmings, trees, brush and other debris completely from sites when performing routine maintenance and landscaping to reduce fire risk.			X	These efforts are ongoing with the City's landscaping and tree maintenance contracts. This mitigation action will be revised and carried into the plan update.
Windstorm #1	Public Awareness Campaign: To provide public education materials to City of Glendora residents and all School District staff, parents and age-appropriate students with mitigation materials pertaining to the protection of life and property before, during, and after a windstorm.			X	The City and partner agencies continue to conduct education and outreach related to severe weather, including Santa Ana winds. This mitigation action will be revised and carried into the plan update.
Windstorm #2	Create local City and utility awareness of tree pruning and Fire Code Sections relevant to wind-resistant utility operations.		X		This action is not necessary; tree trimming related to the electric grid and infrastructure is handled by the service provider, Southern California Edison.
Windstorm #3	Encourage Critical City Facilities to purchase and/or test backup power facilities for use during a power failure. Create an equipment testing log to ensure backup power equipment is in working service.			X	The Glendora Police Department tests backup command post. The Glendora Public Works Department tests backup generator for radio communications. This mitigation action will be revised and carried into the plan update.
Landslide #2	Public awareness regarding hillside ground cover and erosion control.			X	The City and partner agencies continue to conduct education and outreach related to seismic and geologic hazards. This mitigation action will be revised and carried into the plan update.
Dam Failure #1	Produce Dam Inundation Maps	X			Inundation maps approved by the Division of Safety of Dams have been prepared for all dams with the potential to inundate portions of Glendora.
Dam Failure #2	Review Emergency Action Plans (EAP) as they relate to the warning, evacuation, and post-flood actions.			X	The Glendora Police Department reviewed Los Angeles County's EAP's for Big Dalton and Puddingstone. This mitigation action will be revised and carried into the plan update.

2025 HAZARD MITIGATION ACTIONS

The hazard mitigation actions identified below list those activities that the City will use to reduce their risk of potential hazards. These mitigation actions were reviewed and updated in the context of the updated hazards and vulnerability assessment, community outreach, discussions and collaboration with the LHMP Planning Team, and review and status of the previous plan's mitigation actions. All the mitigation actions that were discussed have been included within the plan. Some of these actions may be eligible for funding through federal and State grant programs and other funding sources as made available to the City. The mitigation actions are intended to address the comprehensive range of identified hazards and associated risks and vulnerabilities. Some actions may address risk reduction from multiple hazards.

The process used to update the hazard mitigation actions for this plan included the following:

- Review of the vulnerability and risk assessment presented in Section 4.0;
- Review of the capabilities assessment presented in Subsection 5.1;
- Review of the City's previously approved hazard mitigation plan mitigation actions;
- Review of the results of the community survey, and feedback received as part of the community outreach and focus outreach meetings; and
- The Planning Team's discussion of concerns/issues that need to be addressed to reduce hazards to critical facilities and the community.

Table 5-4, *Hazard Mitigation Actions*, identifies the mitigation action, hazard(s) it addresses, City Department and/or partner agency/stakeholder responsible for implementation, priority, and the timeline for implementation. The timeline for implementation is defined as follows:

- Ongoing: 1-2 years and ongoing thereafter
- Short-Term: 1 to 2 years
- Medium-Term: 3 years
- Long-Term: 4 to 5 years

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TABLE 5-4: HAZARD MITIGATION ACTIONS

Mitigation Reference Number	Mitigation Action	Hazard(s) Identified	Responsible Departments	Potential Funding Sources	Priority	Timeline
1	The City will incorporate the approved Local Hazard Mitigation Plan into its General Plan Safety Element, including any future updates, to ensure compliance with AB 2140, making the City eligible for additional funding under the California Disaster Assistance Act (CDAA).	Multiple Hazards	Community Development	General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC)	High	Short-Term
2	Identify and pursue funding opportunities to develop and implement local and city mitigation activities.	Multiple Hazards	Community Development	Staff time/General Fund	Medium to High	Long-Term
3	Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration and to enhance outreach and education programs aimed at protection of life and property before, during, and after an event.	Multiple Hazards	Public Information Officer; Public Works; Police; Community Development	Staff time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC); FEMA Hazard Mitigation Grant Program (HMGP)	Low	Long-Term
4	Continue to assess and inventory at-risk critical facilities (buildings and infrastructure) through the Facility Condition Assessment. If vulnerabilities or deficiencies are identified, document a retrofit plan, schedule, and funding source.	Multiple Hazards	Public Works	Staff time/General Fund	Low	Ongoing
5	Strengthen emergency services preparedness and response by linking emergency services with natural hazard mitigation programs and enhancing public education on a regional scale.	Multiple Hazards	Community Development; Police; Public Works	Staff time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC)	High	Long-Term
6	Develop, enhance, and implement education programs aimed at mitigating natural hazards, and reducing the risk to citizens, public agencies, private property owners, businesses, and schools.	Multiple Hazards	Community Development; Police; Public Works	Staff time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC)	High	Long-Term
7	Conduct a feasibility assessment of installation of backup energy systems (solar, battery, fuel cell, natural gas generator) at key critical facilities within the City. Maintain an equipment testing log to ensure backup power equipment is in working service.	Multiple Hazards	Public Works	Staff time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC)	Low	Medium-Term
8	At all City-sponsored communitywide events, advertise and inform residents/business owners of the City's alert notification system and assist people in registering for notifications, if requested.	Multiple Hazards	Police	Staff Time/General Fund	High	Ongoing
9	Partner with the County, neighboring cities, and local nonprofits to identify potential housing/shelter opportunities, including funding resources, for vulnerable populations in the event of a hazard resulting in displacement.	Multiple Hazards	Police, Community Development	Staff Time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC); FEMA Hazard Mitigation Grant Program (HMGP)	Medium to High	Medium- to Long-Term
10	Partner with local nonprofits to identify and implement targeted mitigation actions to support vulnerable or underserved populations.	Multiple Hazards	Police, Community Development	Staff Time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC); LUCI Extreme Heat and Community Resilience Program	High	Ongoing
11	Partner with the local community and other organizations, such as L.A. CADA, the American Red Cross, religious organizations, non-profits, and partner agencies to work directly with vulnerable populations (elderly, homeless, low income, special needs, etc.) to	Multiple Hazards	Police, Public Works, Community Development	Staff Time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC);	High	Ongoing

Mitigation Reference Number	Mitigation Action	Hazard(s) Identified	Responsible Departments	Potential Funding Sources	Priority	Timeline
	identify opportunities to mitigate impacts in the event of a natural disaster, including the identification of available resources and how to access and implement those resources.			LUCI Extreme Heat and Community Resilience Program		
12	Consider developing pre-established contracts/ memorandums of understanding (MOUs) with outside entities to ensure availability of equipment to assist with hazard mitigation.	Multiple Hazards	Public Works, Community Development	Staff Time/General Fund; LUCI Regional Resilience Planning and Implementation Grant Program	Medium	Medium-Term
13	Avoid locating new critical facilities within or immediately adjacent to mapped hazard zones, where feasible. If no feasible alternative exists, integrate best-practices into the development to reduce vulnerability and risk to the maximum extent.	Multiple Hazards	Public Works, Community Development	Staff Time/General Fund	Medium	Ongoing
14	Review Emergency Action Plans (EAP) as they relate to the warning, evacuation, and post-flood actions.	Dam/Reservoir Failure	Police	Staff time/General Fund	Medium	Ongoing
15	Continue to monitor and review the results of the annual dam inspections conducted by the Division of Safety of Dams. If the inspections determine physical improvements are required, coordinate with the owners to document a plan to implement the necessary improvements, including a schedule and provide assistance to identify opportunities for funding.	Dam/Reservoir Failure	Public Works, Community Development	Staff time/General Fund	Medium	Ongoing
16	Proactively monitor and communicate drought conditions or water conservation warnings issued by State and Federal agencies.	Drought	Public Works (Water Division)	Staff time/General Fund	High	Ongoing
17	Educate residents and business owners on water conservation, the availability of financial incentives and programs to conserve water and encourage implementation of water-saving measures.	Drought	Public Works (Water Division)	Staff time/General Fund	Medium	Ongoing
18	Continue to offer information and services that reduce water usage, are cost-effective, and provide cost savings for both the property owner and tenants. Water conservation resources can include, but are not limited to, low-cost or free water audits, rebate programs, and pilot programs.	Drought	Public Works (Water Division)	Staff time/General Fund; California DWR Watershed Resilience Program	Medium	Ongoing
19	Encourage property owners to improve drainage on their properties through low-impact development features.	Flood	Public Works	Staff Time/General Fund	Medium	Ongoing
20	In coordination with LACFCD, maintain flood control facilities. Develop and implement a storm drain clean out program for areas prone to urban flooding.	Flood	Public Works, in coordination with LACFCD	Staff Time/General Fund	Medium	Medium-Term
21	Work with owners of critical facilities to ensure facilities are evaluated for seismic safety. If any critical facilities are determined to be seismically vulnerable, work with the owner to identify a plan for implementation of seismic retrofit, including schedule and assist to identify potential funding sources.	Seismic and Geologic Hazards	Community Development; Public Works	Staff Time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC); FEMA Pre-disaster Mitigation Program (PDM)	Medium	Long-Term
22	Coordinate with property owners and other community partners to identify funding and in-kind resources and develop a small project-based seismic retrofit program to educate and directly assist property owners and renters with simple earthquake mitigation activities to reduce the potential for injury and damage and the strain on City resources during an event. Examples include anchoring bookcases, dressers, and file cabinets, installing latches on drawers and cabinet doors, securing desktop computers and appliances, using flexible	Seismic and Geologic Hazards	Community Development; Public Works	Staff Time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC); FEMA Pre-disaster Mitigation Program (PDM)	High	Short-Term

Mitigation Reference Number	Mitigation Action	Hazard(s) Identified	Responsible Departments	Potential Funding Sources	Priority	Timeline
	connections on gas water lines, and securely mounting framed pictures and mirrors.					
23	Identify and seek funding opportunities for low- to moderate-income homeowners to identify the need for and to implement seismic retrofit projects.	Seismic and Geologic Hazards	Community Development; Public Works	Staff Time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC); FEMA Pre-disaster Mitigation Program (PDM)	High	Short- to Medium Term
24	Monitor conditions during a high wind event to ensure fallen tree limbs or debris do not block roadways or the storm drain system.	Severe Weather	Public Works	Staff Time/General Fund	High	Ongoing
25	Coordinate with property owners and other community partners to identify funding and in-kind resources for low- to moderate-income homeowners to implement small project-based structural improvements to mitigate potential damage associated with heavy rains or Santa Ana wind events. Examples include roof repair/ replacement, rain gutter repair/cleanout, tree trimming/ removal, downspouts, rain barrels, or other drainage improvements.	Severe Weather	Community Development; Public Works	Staff Time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC); FEMA Pre-disaster Mitigation Program (PDM); LUCI Adaptation Planning Grant Program	High	Short- to Medium- Term
26	Monitor trees, limbs, and other vegetation near power lines, and promptly inform Southern California Edison of the need for any tree trimming.	Severe Weather	Public Works	Staff Time/General Fund	High	Ongoing
27	Provide education, particularly to vulnerable populations, about the dangers of extreme heat and ways to stay safe when extreme heat events occur. Continue to publicize the locations of cooling centers in the community. Explore opportunities to further support vulnerable populations and underserved communities during extreme heat events.	Severe Weather	Community Development	Staff Time/General Fund	High	Ongoing
28	Partner with agency partners, including the electric utility provider, to enhance outreach and education programs designed to increase awareness about fires, identify potential vulnerabilities, and implement fire mitigation techniques. Develop communication methods and approaches that include underserved or vulnerable populations, who may be uniquely impacted by wildfire risk.	Wildfire	Community Development, in coordination with LACoFD	Staff time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC)	High	Long-Term
29	Reduce wildfire risks by enforcing fire-related requirements pertaining to evacuation routes, minimum road widths, clearances around structures, and peak load water supply for fire response.	Wildfire	Community Development, Public Works, in coordination with LACoFD	Staff time/General Fund	High	Ongoing
30	Perform mechanical thinning, weed abatement, and other wildfire mitigation activities, both independently and in coordination with LACoFD.	Wildfire	Public Works, in coordination with LACoFD	Staff time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC)	High	Ongoing
31	Clear trimmings, trees, brush and other debris completely from sites when performing routine maintenance and landscaping to reduce fire risk.	Wildfire	Public Works, in coordination with LACoFD	Staff time/General Fund	High	Ongoing
32	Adopt and enforce the most up-to-date California Building Code and California Fire Code, with local amendments as appropriate.	Wildfire	Community Development	Staff time/General Fund	High	Ongoing
33	Coordinate with LACoFD to educate homeowners on opportunities for home hardening and vegetation management to address wildfire risk.	Wildfire	Community Development, in coordination with LACoFD	Staff time/General Fund; FEMA Building Resilient Infrastructure and	High	Long-Term

Mitigation Reference Number	Mitigation Action	Hazard(s) Identified	Responsible Departments	Potential Funding Sources	Priority	Timeline
				Communities (BRIC); Cal OES/CAL FIRE California Wildfire Mitigation Program (CWMP)		
34	Continue to review Wildfire Mitigation Plans prepared by the electric utility provider and coordinate opportunities to implement measures to reduce fire caused by electric infrastructure.	Wildfire	Community Development, Public Works	Staff time/General Fund; FEMA Building Resilient Infrastructure and Communities (BRIC); FEMA Pre-disaster Mitigation Program (PDM)	High	Long-Term

Ongoing: 1-2 years and ongoing thereafter
Short-Term: 1 to 2 years
Medium-Term: 3 years
Long-Term: 4 to 5 years
Note: *The Potential Funding Sources column identifies potential grant programs for the City to pursue. No award has been made at this time, and other grant programs may apply.

Section 6.0 | Plan Maintenance

This section outlines the formal process for maintaining the LHMP as an active and relevant document. It includes a schedule for annual monitoring and evaluation, along with a five-year update cycle, to ensure the City remains eligible for federal and State hazard mitigation funding. Additionally, the section details how the City will integrate public participation into the plan's maintenance and implementation, and how it will incorporate the mitigation actions outlined in the plan into existing planning mechanisms and programs. The plan's format also allows for easy updates when new data becomes available, ensuring it remains current and effective.

6.1 METHOD AND SCHEDULE FOR MAINTAINING AND UPDATING THE PLAN

PURPOSE AND AUTHORITY

Section 201.6.(d)(3) of Title 44 of the Code of Federal Regulations requires that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval to remain eligible for benefits awarded under the DMA. As described below, monitoring the progress of the mitigation actions will be on-going throughout the five-year period between the adoption of the LHMP and the next update effort. The LHMP Planning Team will meet on an annual basis to monitor the status of the implementation of mitigation actions and develop updates as necessary.

The City intends to update the plan on a five-year cycle from the date of initial plan adoption. It is anticipated that this update process will be initiated 18 months prior to expiration of the existing plan. The cycle may be accelerated to less than five years based on the following triggers:

- A presidential disaster declaration that impacts the City.
- A hazard event that causes loss of life.

Under the direction of the City's Project Management Team, which is comprised of designees from the Police Department and Community Development Department, the LHMP Planning Team (identified in Section 2.0, *Planning Process*) will be responsible for the on-going maintenance and five-year update of this LHMP. The Police Department designee will take the primary lead in the LHMP maintenance by coordinating maintenance of this plan with the Planning Team, including undertaking the formal review process and updating the plan. Key City departments who should have an active role in maintenance and future updates are identified below.

- Police Department
- Community Development
- Public Works
- Risk Management
- Human Resources

In addition to City staff, the following partner agencies, organization, and stakeholders who were invited to and/or participated on the Planning Team during preparation of the plan should be included in the maintenance and future update activities:

- Azusa Pacific University
- City of Azusa
- City of Covina
- City of San Dimas
- Charter Oak Unified School District
- Citrus College
- Emanate Health
- Foothill Gold Line
- Glendora Unified School District
- Los Angeles County Area D Disaster Management
- Los Angeles County Fire
- Los Angeles County Public Works (Flood)
- Pomona Valley Hospital
- Red Cross
- Southern California Edison
- Southern California Gas Company
- St. Lucy's Priory High School
- U.S. Forest Service

The composition of the Planning Team may change over time, but key City staff positions, departments, and partner agencies should remain integral to the plan's ongoing implementation and maintenance. Opportunities to expand the Planning Team should also be considered, particularly by including stakeholders who are outside the core team. This should include community partners, service agencies, and organizations that directly engage with the community, with particular focus on underserved and vulnerable populations.

The Project Management Team, led by designees from the Police Department and Community Development Department, will facilitate the Planning Team meetings and assign tasks related to plan updates, presentations, and coordination with other departments, stakeholder groups, or elected officials. This ensures the plan is communicated and integrated across various sectors of the City.

The Planning Team will be responsible for maintaining, updating, and implementing the plan through their respective departments and agencies. Plan implementation and evaluation will be a shared responsibility among all team members, requiring close coordination to ensure that the goals and strategies outlined in the plan are effectively achieved.

ANNUAL PLAN MONITORING AND MAINTENANCE

It will be important to monitor the progress of the mitigation actions throughout the five-year period between adoption and the next required update. At a minimum, designees from the Police Department and Community Development Department, representatives from each City Department, and Planning Team members should meet annually to monitor implementation of the LHMP. However, in the event a significant disaster occurs within Glendora, the Police Department designee, Community Development Department designee, and City Department representatives will convene within 30 days of the disaster to review and update the LHMP as needed. In addition to City staff, partner agencies, organizations, and stakeholders, may be identified for participation, as appropriate.

Designees from the Police Department and Community Development Department will coordinate with responsible City departments and agencies/organizations identified for each mitigation action. These responsible departments and agencies/organizations will monitor and evaluate the progress made on the implementation of mitigation actions and report to the LHMP Planning Team on an annual basis. Working with the LHMP Planning Team, these responsible departments and agencies/organizations will be asked to assess the effectiveness of the mitigation actions and modify the mitigation actions as appropriate. A LHMP Mitigation Action Progress Report worksheet or tracking mechanism will assist departments and agencies/organization responsible for implementing mitigation actions in reporting on the status and assessing the effectiveness of the mitigation actions.

Information from the departments and agencies/organizations will be used to monitor mitigation actions and inform the annual evaluation of the LHMP. The following questions will be considered as criteria for evaluating the plan's effectiveness:

- Has the nature or magnitude of hazards affecting the City changed?
- Are there new hazards that have the potential to impact the City?
- Do the identified goals and actions address current and expected conditions?
- Have mitigation actions been implemented or completed?
- Has the implementation of identified mitigation actions resulted in expected outcomes?
- Are current resources adequate to implement the LHMP?
- Can additional local resources be committed to address identified hazards?

As part of the annual meeting, the progress of implementing the mitigation actions will be documented and opportunities to incorporate the actions into other planning documents will be identified. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impacts on the community.
- Review of successful mitigation initiatives identified in the plan.
- Discussion about why targeted mitigation actions were not completed.
- Reevaluation of the mitigation actions to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project due to funding availability).
- Recommendations for new mitigation actions.
- Changes in, or potential for, new funding options/grant opportunities.
- Integration of new data and maps that can be used to inform the plan.
- Evaluation of any other planning programs or initiatives within the City that involve hazard mitigation.

The purpose of the annual evaluation will be to ensure consideration and implementation of the LHMP and document progress to inform future LHMP updates. Future updates to the LHMP will account for any new hazard vulnerabilities, special circumstances, or new information that becomes available. Issues that arise during the annual LHMP evaluation that require changes to the risk assessment, mitigation strategy, and other components of the plan, will be incorporated into the next update of the LHMP in 2030. The questions identified above would remain valid during the preparation of the 2030 plan update.

FIVE-YEAR UPDATE

The intent of the five-year update process will be to add new planning process methods, community profile data, hazard data and events, vulnerability analyses, mitigation actions, and goals to the adopted plan so that the LHMP will always be current and up to date. Based on the needs identified by the Planning Team and incorporating information from the annual monitoring and maintenance activities, the update will, at a minimum, include the elements below:

- The update process will be convened 18 months prior to expiration of the existing plan through a Planning Team identified by the City's Project Management Team.
- The hazard risk assessment will be reviewed and updated using the best available information and technologies.
- Based on new/updated information provided by facility owners and available funding, the evaluation of critical facilities and mapping will be updated and improved.
- The mitigation actions will be reviewed and revised to account for any actions completed, deferred, or changed to account for changes in the risk assessment or new City policies identified under other planning mechanisms, as appropriate (such as the City's General Plan).
- The draft update will be sent to appropriate agencies for comment.
- The public will be given an opportunity to comment prior to adoption.
- The City Council will adopt the updated LHMP.

6.2 ADOPTION

The LHMP update will be presented to both the Glendora Planning Commission and the City Council prior to transmittal to Cal OES and FEMA for review. The Glendora City Council is responsible for adopting the LHMP. This formal adoption should take place every five years. Once the plan has received FEMA Approval Pending Adoption, the City Council will be requested to adopt the plan. Upon adoption, the Project Management Team will transmit the adopted plan and resolution to Cal OES.

6.3 INCORPORATION INTO EXISTING PROGRAMS AND PLANNING MECHANISMS

The effectiveness of the nonregulatory LHMP depends on the implementation of the plan and incorporation of the mitigation action items into City plans, policies, and programs. The City's General Plan is an integral part of this plan. The City, through updating the General Plan Safety Element concurrent with the LHMP, has planned for the impact of hazards. The LHMP process has allowed the City to review the goals and policies contained in the General Plan Safety Element and identified mitigation actions that will further implement these policies. The City views the

General Plan and the LHMP as complementary planning documents that work together to achieve the goal of risk and vulnerability reduction to Glendora citizens and property. Many of the ongoing recommendations identified in the mitigation strategy further the goals and policies of the General Plan and other adopted plans. Further, as part of the Safety Element update, the City will acknowledge the LHMP and will continue to incorporate it by reference.

The plan includes a range of action items that, if implemented, would reduce loss from hazard events in the City. Together, the mitigation action items in the LHMP provide the framework for activities that the City may choose to implement over the next five years. The City has prioritized the plan's goals and identified actions that will be implemented (resources permitting) through existing plans, policies, and programs. In addition to the General Plan, the City will coordinate the recommendations of the LHMP with other existing plans and programs, which include, but are not limited to:

- Glendora General Plan Updates
- County of Los Angeles All-Hazards Mitigation Plan
- Capital Improvement Program
- Glendora Municipal Code
- California Environmental Quality Act Review

As a guidance document, implementation of the mitigation actions can be accomplished most effectively by integrating the LHMP into ongoing programs, policies, and practices. Additional opportunities to integrate the mitigation actions include the following:

- Integration of mitigation actions in emergency response and post-disaster recovery planning.
- Ongoing education and outreach programs to increase staff, residents, business owners, employees, and overall community awareness of the risks and opportunities to implement mitigation actions associated with natural hazards.
- Continued coordination with the City and other partner agencies and organizations on emergency operations and training opportunities.
- Continued consideration of hazard implications and opportunities to implement hazard mitigation as City plans, policies, procedures, and practices are prepared and updated.

The LHMP Project Managers (Public Safety Management Analyst and Principal Planner) are responsible for overseeing the plan's implementation and maintenance through the City's existing programs. The Public Safety Management Analyst, Principal Planner, or designated appointee will assume lead responsibility for facilitating LHMP implementation and maintenance meetings. Although the Police Department will have primary responsibility for review, coordination, and promotion, plan implementation and evaluation will be a shared responsibility among all

departments identified as lead departments in the mitigation action plan. The City will reference and incorporate this LHMP into all relevant planning documents, programs, decisions, processes, and regulations. The LHMP will be reviewed and considered by internal City departments, as applicable plans or programs are drafted or updated in the future. Opportunities to integrate the mitigation action plan into other planning mechanisms and documents will be identified as part of the annual plan monitoring and maintenance described in Section 6.1.

2015 NATURAL HAZARD MITIGATION PLAN PAST INCORPORATION EFFORTS

The hazard mitigation actions identified in the City's previously adopted 2015 Natural Hazard Mitigation Plan were incorporated into existing programs and other planning mechanisms when appropriate. Several successful integrations of the 2015 LHMP are outlined in Table 5-3, as previous mitigation actions marked "completed." For example, the City implemented Mitigation Reference Number Earthquake 1 and 2 by including seismic hazard mapping data and evacuation information into the LHMP Update and General Plan Safety Element update, as required by State law. Mitigation Reference Number Dam Failure 1 was implemented by including the new dam inundation maps approved by the Division of Safety of Dams into the into the LHMP Update and General Plan Safety Element update. Additionally, the City implemented Mitigation Reference Number Multi-Hazard 9 by reviewing applicable development projects for compliance with existing ordinances, including the Model Water Efficient Landscaping Ordinance and Storm Water and Runoff Pollution Control Ordinance.

6.4 CONTINUED PUBLIC INVOLVEMENT

The City recognizes the need for continued public involvement throughout the five-year planning period to keep community members and partner agencies updated on the LHMP, including socially vulnerable populations. The public will continue to be informed on LHMP actions through regular updates to the City websites and through annual progress reports. The adopted LHMP will remain permanently available for review on the City's website, with contact information for interested parties to direct comments and concerns. Additionally, the City will ensure continued public involvement through the promotion of hazard and emergency preparedness education, interagency coordinated outreach efforts, public disaster fairs, drills and other hazard awareness campaigns as included in applicable Mitigation Actions in Section 5.0, Hazard Mitigation Strategy. These mitigation actions include outreach and communication methods designed to appeal to the entire community, including targeted outreach to socially vulnerable populations. All public feedback will be reviewed and considered for incorporation (if deemed appropriate) into the next LHMP update. Additionally, coordination and implementation of individual mitigation actions will involve direct coordination and interaction with the public, such as those involving targeted support to vulnerable or underserved populations, programs to assist property owners and renters to implement risk reduction improvements, and working with Homeowners Associations, property managers, and property owners. Implementation of these mitigation actions will provide additional opportunities for continued public involvement and assist in determining how best to implement

mitigation actions, assess the effectiveness of the mitigation actions, and identify additional opportunities for mitigation actions to be considered in the next update. Upon initiation of the LHMP update, the Planning Team will review feedback and outreach efforts, which will be analyzed and incorporated into a new public involvement strategy based on the needs and capabilities of the City at the time of the update. At a minimum, this strategy will include the use of the City website, email distribution lists, and social media, as well as coordination with partner agencies and organizations, and will include specific outreach to vulnerable populations.

6.5 POINT OF CONTACT

Primary point of contact for the LHMP:

Julie Linger, P.E., T.E.
Business Services Manager
City of Glendora
150 S. Glendora Avenue
Glendora, CA 91741
(626) 852-4880
JLinger@cityofglendora.gov

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APPENDIX A
City Adoption Resolution

PLACEHOLDER FOR RESOLUTION

APPENDIX B
Planning Process Documentation

[redacted]

From: Linger, Julie <JLinger@cityofglendora.org>
Sent: Monday, May 15, 2023 9:05 AM
To: [redacted]
Cc:
Subject:

Good Morning,

The City of Glendora is initiating preparation of a Local Hazard Mitigation Plan (LHMP). Mitigation plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. It is the City's intent to obtain a FEMA-approved LHMP.

As part of the planning process, we are assembling a team of partners to participate on the planning team. The Planning Team will be the core group responsible for making decisions, guiding the planning process, and agreeing upon the final contents of the plan.

We would like to invite you to be part of the Planning Team. There will be four planning team meetings held the fourth Wednesday of the month, beginning June 28, 2023, at the Glendora Police Department (150 S. Glendora Avenue). The meetings will be for two hours, from 10:00 a.m. to 12:00 p.m. The remaining Planning Team meetings are tentatively scheduled for July 26, August 23, and October 25. We understand the importance of your time and the meetings will be structured to maximize results.

Please let me know if you (or a designee) can participate on the Planning Team. We appreciate your time and commitment. Your involvement will ensure a comprehensive and robust plan that meets FEMA's requirement of incorporating a whole community approach in the development process.

For planning purposes, please provide a response regarding your participation by May 26, 2023. If you have any questions regarding development of the LHMP and your involvement, please contact me.

Thank you,
Julie

Julie Linger | Public Safety Management Analyst
Glendora Police Department | City of Glendora
150 S. Glendora Ave. | Glendora, CA 91741
jlinger@glendorapd.org
[redacted]

[redacted]

From: [redacted]
Sent: Tuesday, June 27, 2023 7:31 AM
To: 'Linger, Julie'; 'HFriedel@cityofglendora.org'; [redacted]
Subject: Glendora LHMP - Planning Team Meeting #1 - June 28
Attachments: Glendora LHMP Update_Planning Team Mtg #1_Agenda.pdf

Good morning Planning Team,

Thank you again for participating on the Planning Team for the City of Glendora's update to their Local Hazard Mitigation Plan. We are looking forward to seeing you tomorrow and/or at our future meetings. Attached is the Agenda for the first meeting. Tomorrow will serve partly as an introduction to the team and the process, as well as starting to identify key information and input for the plan update. There is no preparation required; we ask that you bring your knowledge and understanding of the community and specific expertise and be prepared to discuss and share information. It is not necessary, but if you would like to review the City's 2015 plan prior to the meeting, it can be downloaded at the dropbox link below. Since we will be updating the plan, we will revisit the 2015 document as part of our process.

https://www.dropbox.com/t/EkYsykPDxLJ2oOqF

If you have any questions prior to the meeting, please reach out to Julie Linger or myself.

Thank you,

[redacted]

GLENDORA
LOCAL HAZARD MITIGATION PLAN UPDATE

HAZARD MITIGATION PLANNING TEAM MEETING #1

Wednesday, June 28, 2023
10:00 am – 12:00 pm

AGENDA

1. Introductions

2. Roles and Responsibilities
    a. Data needs
    b. Planning Team meetings

3. Project and LHMP Goals

4. Purpose and Requirements of the LHMP
    a. What is Hazard Mitigation and a Hazard Mitigation Plan?
    b. Plan requirements
    c. LHMP process
    d. LHMP process – risk assessment

5. Confirm Hazards and Identify Community Assets
    a. 2015 LHMP hazards
    b. Identify community assets

6. Next Steps
    a. Planning Team
    b. Plan development

7. Questions/Additional Discussion

Planning Team Meetings:

- July 26, 2023; 10:00 am – 12:00 pm
- August 23, 2023; 10:00 am – 12:00 pm
- October 25, 2023; 10:00 am – 12:00 pm

Local Hazard Mitigation Plan

Planning Team Meeting #1

June 28, 2023

CityOfGlendora.org

AGENDA

- Introductions
- Roles and responsibilities
- Project and LHMP goals
- Purpose and requirements of the LHMP
- LHMP Process
- Confirm hazards and identify community assets
- Next steps

ROLES AND RESPONSIBILITIES

- Our Job
  - Facilitate the process
  - Provide LHMP technical expertise
  - Maintain schedule
  - Do the heavy work
  - Ensure FEMA-compliant plan
- What We Ask of You
  - Participate
  - Assist with outreach
  - Provide agency-specific information, local insight and expertise
  - Meet internal deadlines
  - Ensure plan is feasible and meets needs

ROLES AND RESPONSIBILITIES

- Data Needs
  - Plans/studies
  - Policies/programs
  - Technical data
  - Intrinsic/historic knowledge
  - Photos
  - Asset inventory for loss estimates
  - Any additional relevant information

ROLES AND RESPONSIBILITIES

- Planning Team Meetings
  - Meeting #1 – June 28: process; confirm hazards and identify community assets
  - Meeting #2 – July 26: hazard profiles & mapping; risk assessment
  - Meeting #3 – August 23: capabilities assessment; mitigation goals and actions
  - Meeting #4 – October 25: refine mitigation actions and prioritization

PROJECT AND LHMP GOALS

- Update plan with current and relevant information
- Achieve certification by FEMA for mitigation funding
- Establish framework to review and update plan
- Useful and implementable
- Others?



Disaster Mitigation Act (DMA) of 2000 requires states and local governments prepare a hazard mitigation plan as a precondition for receiving FEMA mitigation project grants.

PROJECT AND LHMP GOALS

- 2015 LHMP Mitigation Goals
  - Protect life and property
  - Enhance public awareness
  - Preserve natural systems
  - Encourage partnerships and implementation
  - Strengthen emergency services
- Any revisions/modifications? Other goals?

PURPOSE AND REQUIREMENTS OF THE LHMP

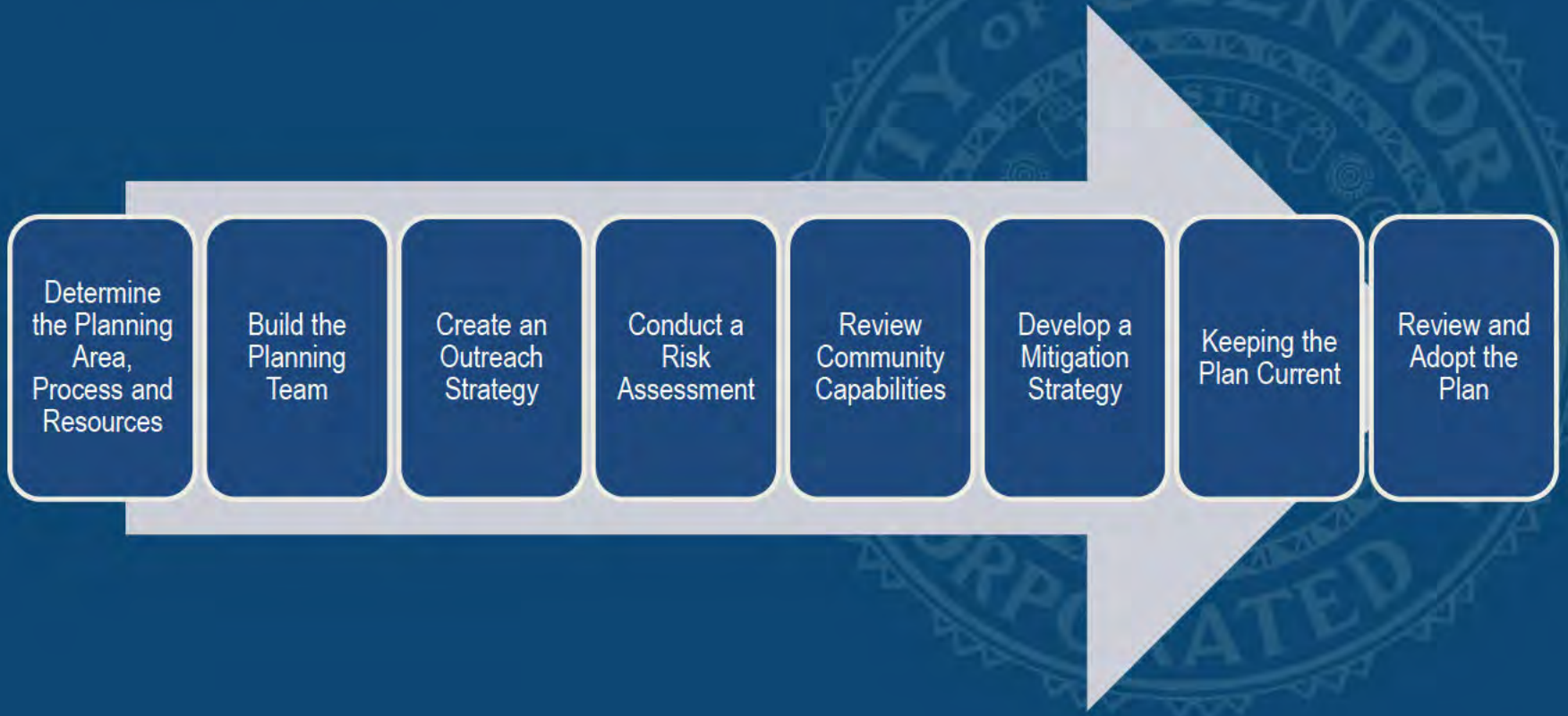
What is Hazard Mitigation?

- Sustained actions taken to reduce or eliminate long-term risk to life and property from hazards

PURPOSE AND REQUIREMENTS OF THE LHMP

- Provide and document the planning process, including opportunities for stakeholder and public involvement
- Review and incorporate new plans, studies, reports and technical information; address changes in development and priorities
- Validate/update hazards and hazard profiles since last plan
- Validate/update community assets and capabilities
- Update risk assessment and mitigation strategy
- Identify how the plan will be monitored, evaluated, and updated within a five-year cycle

LHMP PROCESS



LHMP PROCESS – RISK ASSESSMENT

Identify & Describe Hazards

CONFIRM HAZARDS

- 2015 LHMP Hazards
  - Earthquakes
  - Flood
  - Wildfire
  - Landslide
  - Dam Failure
  - Windstorm

Climate change and risks will need to be integrated into the update

IDENTIFY COMMUNITY ASSETS

- Assets are anything important to the character and function of a community
  - People, including underserved communities and socially vulnerable populations
  - Structures, including new and existing buildings
  - Community lifelines and other critical facilities
  - Natural, historic and cultural resources
  - Economy and other activities that have value to the community

IDENTIFY COMMUNITY ASSETS



For each community asset category:

- Identify **2-3 assets at risk to hazards**
- Write 1 asset on each post-it
- Place post-its on sheet by community asset category

NEXT STEPS

- Planning Team
  - Provide any information or resources to Julie Linger by July 14
    - Plans/studies
    - Policies/programs
    - Technical data
    - Intrinsic/historic knowledge
    - Photos
    - Assets
  - Attend Meeting #2 – July 26, 2023

NEXT STEPS

- Plan Development
  - Confirm LHMP template
  - Update community profile
  - Update/prepare hazard profiles and mapping
  - Confirm outreach strategy

Questions/Additional Discussion?



Avalanche	Flood	Sea level rise
Climate change	Geological hazards	Seismic hazards
Coastal erosion	Hailstorm	Severe winter storm
Coastal storm	Hazardous materials	Tornado
Dam/reservoir failure	Human-caused hazards	Tsunami
Disease/pest management	Hurricane	Volcano
Drought	Land subsidence	Wildfire
Earthquake fault rupture	Landslide and mudflow	Wind
Expansive soils	Lightning	Windstorm
Extreme heat	Liquefaction	

Glendora
Local Hazard Mitigation Plan
Planning Team Meeting #1
June 28, 2023

Last and First Name	Title	Organization/Department	E-Mail Address	Phone Number	Initials
Anderson, Erik	Assistant Planner	De Novo Planning Group	[redacted]		[redacted]
Barker, Starla	Principal Planner	De Novo Planning Group	[redacted]		
Clark, Jessica	Business Services Mgr.	City of Glendora, Public Works	[redacted]		
Chan, Ryan	Disaster Program Manager	Red Cross	[redacted]		
Diaz, George	Corporate Director of Safety and Security	Emanate Health			
Egan, Matt	Police Chief	City of Glendora, Police Department			
Friedel, Hans	Principal Planner	City of Glendora, Planning Division			
Fry, Tamra	Safety/Risk Compliance Officer	Glendora Unified School District			
Inman, Mike	Assistant Fire Chief	Los Angeles County Fire			

Glendora
Local Hazard Mitigation Plan
Planning Team Meeting #1
June 28, 2023

Last and First Name	Title	Organization/Department	E-Mail Address	Phone Number	Initials
Lind, Bob	Director of Maintenance and Operations	Charter Oak Unified School District	[redacted]		[redacted]
Linger, Julie	Public Safety Management Analyst	City of Glendora, Police Department			
Livas, Anissa	Senior Administrative Analyst	City of San Dimas			
Macias, Ben	Director of Campus Safety	Citrus College			
O'Shields	Public Affairs Mgmr.	Southern California Gas Company			
Pankratz, Dain	Safety Manager	Foothill Gold Line			
Randazzo, Mike	Police Captain	City of Glendora, Police Department			
Ricci, Marie	Administrative Services Director	City of Glendora, Risk Management			
Rodriquez, Nahomi	AmeriCorps ~~VISTA~~	Red Cross			

Glendora
Local Hazard Mitigation Plan
Planning Team Meeting #1
June 28, 2023

Last and First Name	Title	Organization/Department	E-Mail Address	Phone Number	Initials
Sharma, Angela	Assistant Director, Environment of Care and Emergency Management	Emanate Health	[redacted]	[redacted]	[redacted]
Stabio, Chris	Police Captain	City of Glendora, Police Department			
Storbakken, Steven	Police Lieutenant	Pomona Valley Hospital			
Watson, Adriana	Community Services Liaison	Los Angeles County Fire			
Wendling, Rita	Interim Assistant Director	City of Glendora, Human Resources			
Wu, Jennifer	Emergency Manager	City of Azusa			
Robinson, Noble	LACo FD Battalion Chief	Los Angeles County Fire Dept			

Local Hazard Mitigation Plan

Planning Team Meeting #2

July 26, 2023

CityOfGlendora.org

AGENDA

- Hazards to be Profiled
- Critical Facilities
- Problem/Issue Statements
- Capabilities Assessment
- Review Existing Mitigation Actions
- Public Involvement Update
- Next Steps

LHMP PROCESS – RISK ASSESSMENT

Identify & Describe Hazards

- Location
- Extent
- Previous occurrence
- Probability of future events

Identify Community Assets

- People
- Structures
- Community lifelines and critical facilities
- Natural, historic and cultural resources
- Economy/activities that have value to the community

Analyze Impacts

- Identify risks – exposure analysis
- Describe asset vulnerabilities
- Describe potential impacts
- Estimated losses
- Repetitive and severe repetitive loss properties

Summarize Vulnerability

- Structures
- Systems
- Populations

HAZARDS TO BE PROFILED

- Seismic
  - Earthquake, surface faulting, liquefaction, landslide
- Flood
- Wildfire
- Landslide (existing) and mudflow (new)
- Dam failure
  - Add reservoirs?
- Severe weather
  - Santa Ana winds, heavy rain storms, add extreme heat?
- Drought (new)







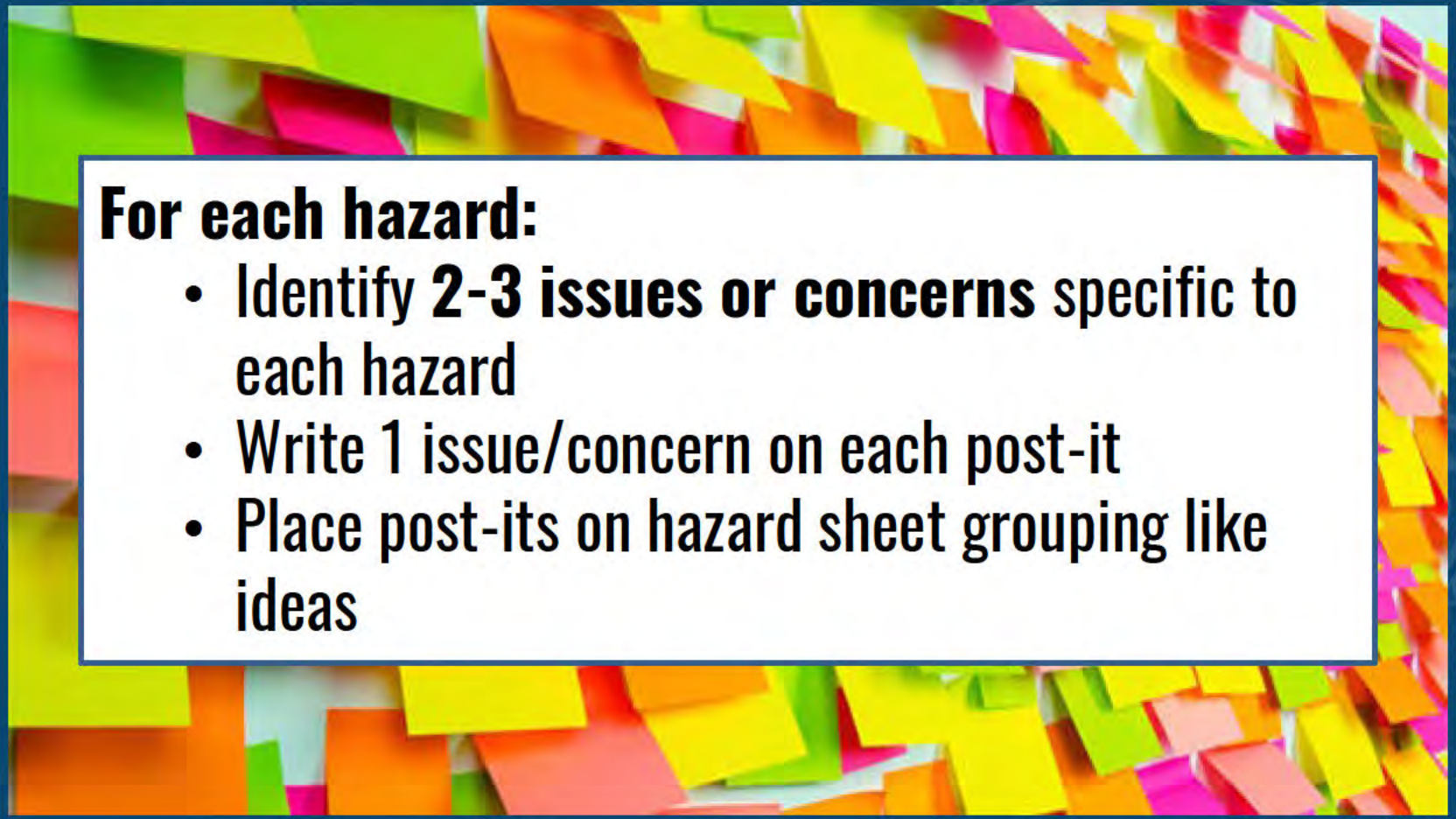
CRITICAL FACILITIES

- Risk assessment will look at what facilities are in hazard zones
  - Considers their replacement cost and value to the community
- Mitigation strategies reflect vulnerabilities of critical facilities
  - Strengthen existing vulnerable facilities
  - Avoid building new ones in at-risk areas

Critical Facilities

- Current Plan
  - City Hall
  - Police Department
  - Fire Station No. 85
  - Fire Station No. 86
  - Fire Station No. 151
- Additions/Revisions
  - Schools
  - Hospitals - dialysis centers, urgent care
  - Community Facilities
    - La Fetra
    - Teen Center
    - Library
    - Legion building
  - Infrastructure – water/wastewater
  - Others?

PROBLEM/ISSUE STATEMENTS



For each hazard:

- Identify **2-3 issues or concerns** specific to each hazard
- Write 1 issue/concern on each post-it
- Place post-its on hazard sheet grouping like ideas

CAPABILITIES ASSESSMENT

- Two components
  - Inventory of existing resources and tools to accomplish mitigation and reduce long-term vulnerability, and understanding of ability to use them effectively
  - Identification of gaps, conflicts, and/or weaknesses that may need to be addressed through mitigation
- Types of capabilities
  - Planning and regulatory
  - Administrative and technical
  - Financiald
  - Education and outreach

CAPABILITIES ASSESSMENT

- Planning and regulatory
  - Ordinances
  - Policies
  - Local laws and state statutes
  - Plans and program that guide and manage growth
- Questions to consider:
  - Does the plan address hazards?
  - Does the plan identify projects to include in the mitigation strategy?
  - Can the plan be used to implement mitigation actions?
  - How can the capabilities be expanded and improved to reduce risk?

CAPABILITIES ASSESSMENT

- Administrative and technical
  - City staff – skills/tools and capacity
  - Public and private resources
  - Ability to access and coordinate resources effectively
- Questions to consider:
  - Is coordination effective?
  - Is staffing adequate to enforce regulations?
  - Is staff trained on hazards and mitigation?
  - Is coordination between agencies and staff effective?
  - Has the capability been used to assess/mitigate risk in the past?
  - How can the capabilities be expanded and improved to reduce risk?

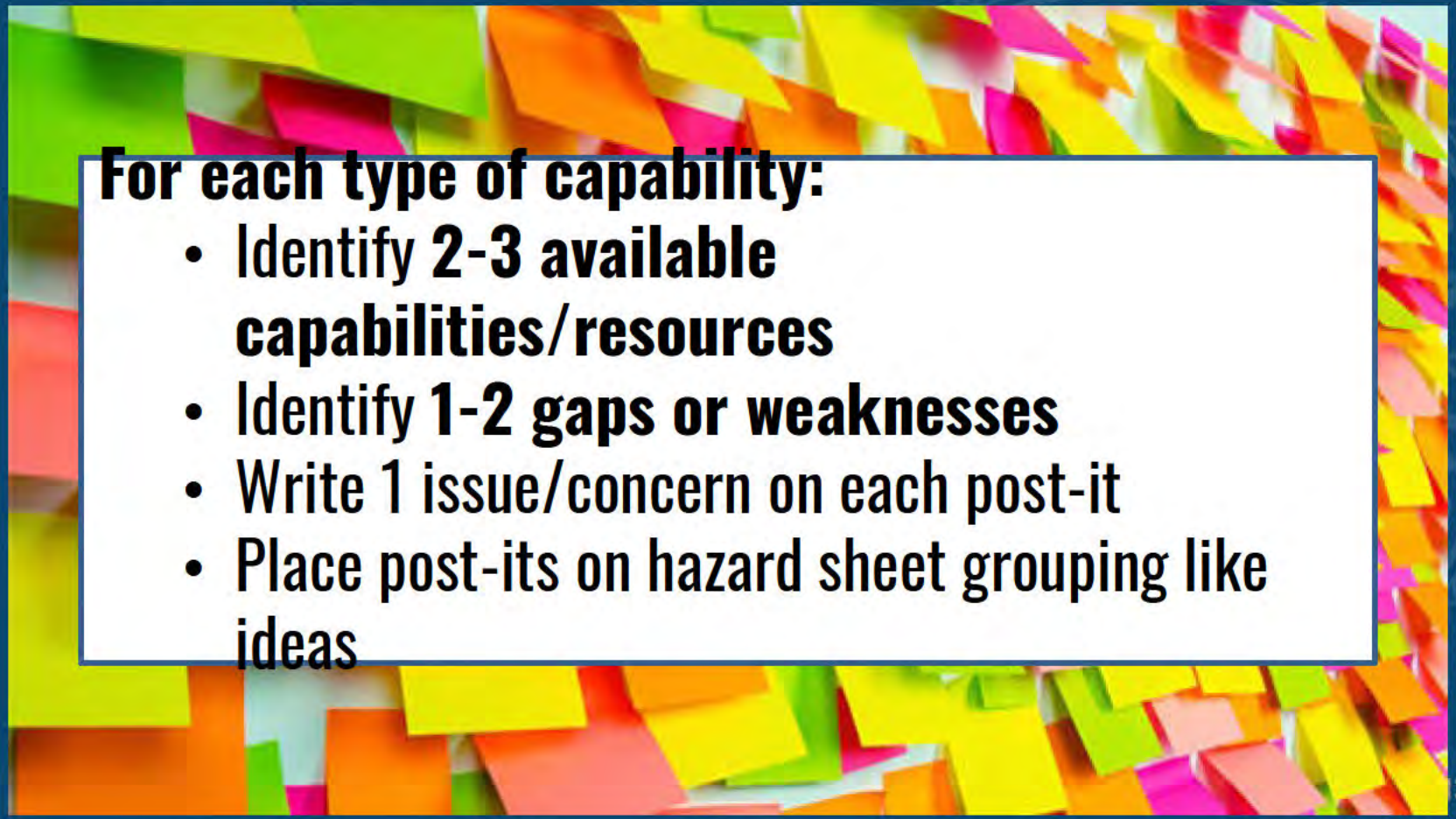
CAPABILITIES ASSESSMENT

- Financial
  - Resources have or eligible to use to fund mitigation
  - Staff time, existing operating budgets, impact fees
  - Local, state and federal funding sources
- Questions to consider:
  - Has the funding resource been used in the past and for what types of activities?
  - Could the resource be used to fund future mitigation actions?
  - How can the capabilities be expanded and improved to reduce risk?

CAPABILITIES ASSESSMENT

- Education and outreach
  - Programs and methods in place to implement mitigation actions and communicate hazard-related information
    - Fire safety programs, education programs
    - Public information or communication activities
- Questions to consider:
  - Could the program/organization help to implement future mitigation activities?
  - How can the capabilities be expanded and improved to reduce risk?

PROBLEM/ISSUE STATEMENTS



For each type of capability:

- Identify **2-3 available capabilities/resources**
- Identify **1-2 gaps or weaknesses**
- Write 1 issue/concern on each post-it
- Place post-its on hazard sheet grouping like ideas

REVIEW EXISTING MITIGATION ACTIONS

- Mitigation actions – reduce or eliminate long-term risk
- Different from actions to prepare or respond to an event
- Mitigation activities lessen or eliminate the need for preparedness or response resources
- Emphasis on the impact or vulnerabilities – not on the hazard itself

PUBLIC INVOLVEMENT UPDATE

- Survey – anticipated in next 2 weeks
- The Prepare Fair – September 14

  Focused Outreach Meetings
  - Seniors
  - Youth
  - Chamber of Commerce
  - Others?



NEXT STEPS

- Planning Team
  - Provide any information or resources to Julie Linger
  - Distribute/Advertise Survey and The Prepare Fair
    - Send links or screenshots to Julie and/or Starla
  - Attend Meeting #3 August 23, 2023

NEXT STEPS

- Plan Development
  - Finalize draft hazard profiles and mapping
  - Prepare and conduct outreach
  - Initiate risk assessment
  - Complete capabilities assessment

Questions/Additional Discussion?



Glendora
Local Hazard Mitigation Plan
Planning Team Meeting #2
July 26, 2023

Last and First Name	Title	Organization/Department	E-Mail Address	Phone Number	Initials
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Barker, Starla	Principal Planner	De Novo Planning Group			
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Glendora
Local Hazard Mitigation Plan
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Wendling, Rita	Interim Assistant Director	City of Glendora, Human Resources			
Wu, Jennifer	Emergency Manager	City of Azusa			
NATE CABIBIL	MAINT. SUPERVISOR	COUSD			

City of Glendora

Planning Updates

Here are a few plans the City is working on this year...



LOCAL HAZARD MITIGATION PLAN

This plan will identify and assess the City's vulnerability to natural and manmade hazards such as floods, drought, wildfires and severe weather, and will identify specific actions that can be taken to reduce the risk from the hazards.



SAFETY ELEMENT

The Safety Element of the General Plan will be updated to include goals and policies to reduce the potential short and long-term risk of loss of life, personal injury, property damage and economic and social dislocation resulting from fire, floods, earthquakes and other hazards.



ENVIRONMENTAL JUSTICE

The General Plan will be updated to include goals and policies that address:

- Pollution Exposure and Air Quality
- Access to Public Facilities and Physical Activity
- Healthy Food Access
- Safe and Sanitary Homes
- Meaningful Community Engagement Opportunities

To learn more and share your input, visit:

https://www.cityofglendora.org/departments/community-development/advanced-planning-community-engagement

City of Glendora

PLANNING UPDATES

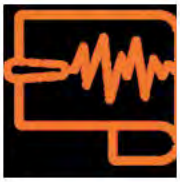
The City is updating the

Safety Element

and

Local Hazard Mitigation Plan

The City's Safety Element and Local Hazard Mitigation Plan (LHMP) work together to identify Glendora's vulnerability to natural and manmade hazards and include specific actions that can be taken to reduce the risk from those hazards such as:



Earthquakes



Floods



Fires



Severe Weather

Visit the Police Department's LHMP booth or project website to share any concerns, ideas, or suggestions related to hazards in Glendora.

Learn More

To learn more, visit the City's website at:

https://www.cityofglendora.org/departments/community-development/advanced-planning-community-engagement

Advanced Planning & Community Engagement

What's New

Your input is important to us! Please take a few minutes to complete a short survey and share your thoughts on (1) Safety and Hazard Mitigation Planning and on (2) Environmental Justice.

SAFETY, HAZARD MITIGATION & ENVIRONMENTAL JUSTICE

The City of Glendora is preparing an update to the General Plan Safety Element and Local Hazard Mitigation Plan (LHMP). The project will address Federal and State requirements to identify hazards and vulnerabilities associated with natural disasters and develop long-term strategies for protecting people and property from future hazard events. Federal law mandates that all state, tribal, and local governments prepare hazard mitigation plans to maintain eligibility for certain funding programs. State law requires local governments to update their safety elements to address fire hazard planning, climate change, and resiliency planning. Glendora will address these Federal and State requirements together with a joint Safety Element/LHMP update process.

In conjunction with the updates to the Safety Element and LHMP, the City will amend the General Plan to include goals and policies that address Environmental Justice, which is defined by the State of California as "the fair treatment and meaningful involvement of people of all races, cultures, incomes, and national origins with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."

Safety Element



The State of California has long recognized the need for local governments to conduct their planning with an awareness of hazards that could affect the people and property within their jurisdictions. Accordingly, State Planning Law requires that all local government general plans include "safety elements" that contain documentation of such hazards and goals, policies, and programs to protect against their impacts. Following the institution of Federal requirements for the preparation of mitigation plans, the California Legislature established a series of requirements to strengthen the linkage between safety elements and LHMPs. This includes substantive requirements that are triggered by the preparation or update of a mitigation plan, most recently through Senate Bill 379, which requires safety elements to include climate adaptation and resiliency content, including a vulnerability assessment, adaptation and resilience goals, policies, and objectives, and feasible implementation measures.

Local Hazard Mitigation Plan



Hazard mitigation is the implementation of sustained actions to reduce or eliminate long-term risk to people and property from natural or human-caused hazards and their effects. Mitigation planning is the collaborative process of determining what actions are appropriate and responsive to local conditions. Consistent with Federal and State requirements and in line with the priorities of the California Office of Emergency Services (Cal OES) and the Federal Emergency Management Agency (FEMA), the mitigation planning process will be documented in a new LHMP that contributes to achieving the following objectives:

- Protection of public safety and prevention of loss of life and injury.
- Reduction of harm to existing and future development.
- Prevention of damage to unique economic, cultural, and environmental assets.

- Minimization of operational downtime and acceleration of restoration of government and business after disasters.
- Reduction of disaster response and recovery costs and exposure to risk for first responders.
- Accomplishment of other community objectives, such as leveraging capital improvements, in .ture protection, open space preservation, and economic resiliency.
- Reduction of exposure for public assets.
- Assistance to the public in becoming more aware of local hazards and their implications.
- Presentation of information to enhance eligibility for Federal and State funding programs.
- Alignment with other planning initiatives.
- Identification of targeted capital improvements focused on risk reduction.

To advance these objectives, the LHMP will identify a combination of physical improvements and emergency management activities that serve to mitigate the impacts of locally relevant hazards. Recognizing that successful mitigation planning efforts must be communicated and understood by the public, the City will include opportunities for local stakeholder participation and input, including through the use of GIS technology to map and update the hazard information for each hazard profiled.

Environmental Justice



In 2016, the State Legislature passed Senate Bill 1000 (SB 1000), also known as "The Planning for Healthy Communities Act", to address the inequitable distribution of pollution and associated health effects in low-income communities and communities of color. SB 1000 requires local governments to identify environmental justice communities (called "disadvantaged communities") in their jurisdictions and address environmental justice in their general plans.

Although Glendora does not have any census tracts that are considered disadvantaged communities (based on findings using CalEnviroScreen 4.0), the City will focus its environmental justice efforts on strategies to reduce pollution exposure and environmental burdens affecting low-income and minority populations within Glendora.

SB 1000 specifies seven topics that need to be integrated into environmental justice-related goals, policies, and implementation programs:

1. Pollution Exposure and Air Quality
2. Public Facilities
3. Food Access
4. Safe and Sanitary Homes
5. Physical Activity
6. Community Engagement
7. Prioritize the Needs of Disadvantaged Communities

How to Get Involved

There are many ways that the public can get involved and provide input. The success of the project depends on residents giving input and insight. It is important that the Safety Element, Local Hazard Mitigation Plan, and Environmental Justice goals and policies reflect Glendora's values and priorities. The community can get involved by:

- Joining the email list to stay informed HFriedel@cityofglendora.org
- Participating in the project outreach events (to be announced)
- Completing an online survey (coming soon)

Documents Available for Viewing

- Current Safety Element

Contacts

For general inquiries regarding the Safety Element and Environmental Justice Project, please contact the Planning Division at (626) 914-8214 or email HFriedel@cityofglendora.org.

For general inquiries about Hazard Mitigation, please contact the Police Department at (626) 914-8250 or email jlinger@glendorapd.org.

Safety Element and LHMP Survey Social Media Posts

Twitter:

Glendora is updating its Local Hazard Mitigation Plan and Safety Element! The City is hosting an online survey to understand the community's concerns on natural and human-made hazards. Please visit https://www.surveymonkey.com/r/FPNX2TK to take the survey and help the community prepare and respond to those hazards.

Facebook:

The Local Hazard Mitigation Plan (LHMP) and Safety Element Updates are currently underway! We want the community's perspective on hazards that could impact Glendora. We are hosting an online survey through Friday, September 22, 2023. Please visit https://www.surveymonkey.com/r/FPNX2TK to get involved. Your input will help the Planning Team understand the community's concerns and will guide development of the LHMP and Safety Element.




Instagram:

We are hard at work at the City of Glendora updating our Local Hazard Mitigation Plan (LHMP) and Safety Element. The LHMP provides a framework for the community to reduce its vulnerability to the impacts of natural hazard events such as earthquakes, flooding, and wildfires, while the Safety Element provides goals, policies, and programs to protect against their impacts. We'd like to know your thoughts on Hazard Mitigation Planning. Please visit https://www.surveymonkey.com/r/FPNX2TK to take a brief survey to help the community prepare and respond to those hazards.




NextDoor:

The City of Glendora is in the process of updating our Local Hazard Mitigation Plan (LHMP) and Safety Element and we want to hear from community members like you about your Hazard Mitigation Planning priorities. We invite you to take an online survey by Friday, September 22nd to provide input that will help the Planning Team understand the community's concerns and

guide development of the LHMP and Safety Element. Please visit https://www.cityofglendora.org/departments/community-development/advanced-planning-community-engagement to learn more and to take the survey.

Nixle:

Glendora is updating its Local Hazard Mitigation Plan and Safety Element! The City has an online survey to understand the community's concerns on natural hazard events such as earthquakes and wildfires, and human-caused events such as hazardous spills. Please visit https://www.surveymonkey.com/r/FPNX2TK to take the survey and help the community prepare and respond to those hazards.

City of Glendora

Senior Digital Media Specialist Greg Morton • 6 days ago

City staff is hard at work updating our Local Hazard Mitigation Plan (LHMP) and Safety Element.

The LHMP provides a framework for the community to reduce its vulnerability to the impacts of natural hazard events such as earthquakes, flooding, and wildfires, while the Safety Element provides goals, policies, and programs to protect against their impacts.

We'd like to know your thoughts on Hazard Mitigation Planning. Please visit https://www.surveymonkey.com/r/FPNX2TK to take a brief survey to help the community prepare and respond to those hazards. Survey ends September 22nd.



City of Glendora Local Hazard Mitigation Plan & Safety Eleme...

surveymonkey.com

Posted to **Subscribers of City of Glendora**

213 Impressions

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- City Mission, Vision and Values
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- City Updates
  - City of Glendora RSS Feeds
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- Glendora Centennial Celebration
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- Glendora Military Memorial
- Glendora Strategic Plan
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CITY UPDATES

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Hazard Mitigation Plan Survey

Post Date: 08/17/2023 11:10 AM

What has been your experience with weather or other hazards in Glendora? Let us know!

The City of Glendora is in the process of updating its Local Hazard Mitigation Plan (LHMP) and Safety Element and we want to hear from community members about their planning priorities. The LHMP provides a framework for the community to reduce its vulnerability to the impacts of natural hazard events such as earthquakes, flooding, and wildfires, while the Safety Element provides goals, policies, and programs to protect against their impacts.

Hurry, the survey ends on Friday, September 22nd!

- Please visit https://www.surveymonkey.com/r/FPNX2TK to take a brief survey to help the community prepare and respond to those hazards.
- Please visit https://www.cityofglendora.org/departments/community-development/advanced-planning-community-engagement to learn more and to take the survey.

Return to full list >>

Free viewers are required for some of the attached documents.
They can be downloaded by clicking on the icons below.

116 E. Foothill Blvd., Glendora, CA 91741-3380 | Phone: 626.914.8200 Fax: 626.914.8221
Website Design by Granicus - Connecting People and Government

City of Glendora - Local Government is in **Glendora**.
Published by Greg Morton · 5d ·

🚨 🚒 We are in the process of updating our Local Hazard Mitigation Plan (LHMP) and Safety Element. Help us better prepare by taking this survey
https://www.surveymonkey.com/r/FPNX2TK

🚨 We'd like to know your thoughts on Hazard Mitigation Planning.

🚨 The LHMP provides a framework for the community to reduce its vulnerability to the impacts of natural hazard events such as earthquakes, flooding, and wildfires, while the Safety Element provides goals, policies, and programs to protect against their impacts.

#Emergencypreparedness #glendora #localgovernment







See insights and ads

Boost post

16

10 comments 3 shares

Like Comment Share



cityofglendora
Glendora, California

cityofglendora 🚨 🚒 We are in the process of updating our Local Hazard Mitigation Plan (LHMP) and Safety Element. Help us better prepare by taking a quick survey in our 🔗. We'd like to know your thoughts on Hazard Mitigation Planning!

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#Emergencypreparedness #glendora #localgovernment

Edited · 5d

robert.andnicola ❤️❤️❤️❤️❤️❤️❤️❤️❤️❤️❤️❤️❤️❤️❤️

5d 1 like Reply

View insights

Boost post

Liked by **glendorachamber** and **505 others**

5 DAYS AGO

Add a comment...

Post



City of Glendora
@CityofGlendora

🚨We are in the process of updating our Local Hazard Mitigation Plan (LHMP) & Safety Element. Help us better prepare by taking this survey surveymonkey.com/r/FPNX2TK
We'd like to know your thoughts on Hazard Mitigation Planning!
#Emergencypreparedness #glendora #localgovernment

4:47 PM · Aug 17, 2023 from Glendora, CA · **337** Views

View post analytics

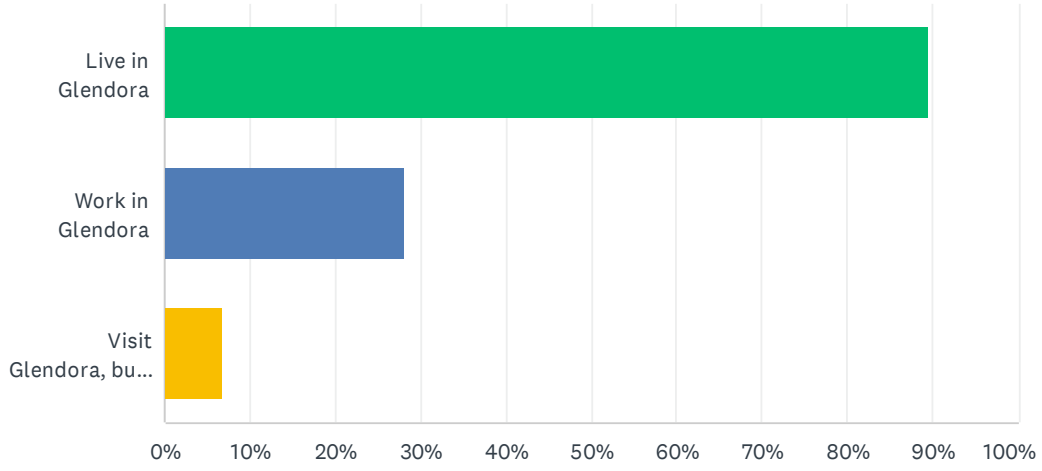
1 Like **1** Bookmark

Post your reply!

Reply

Q1 Do you... (Check all that apply)

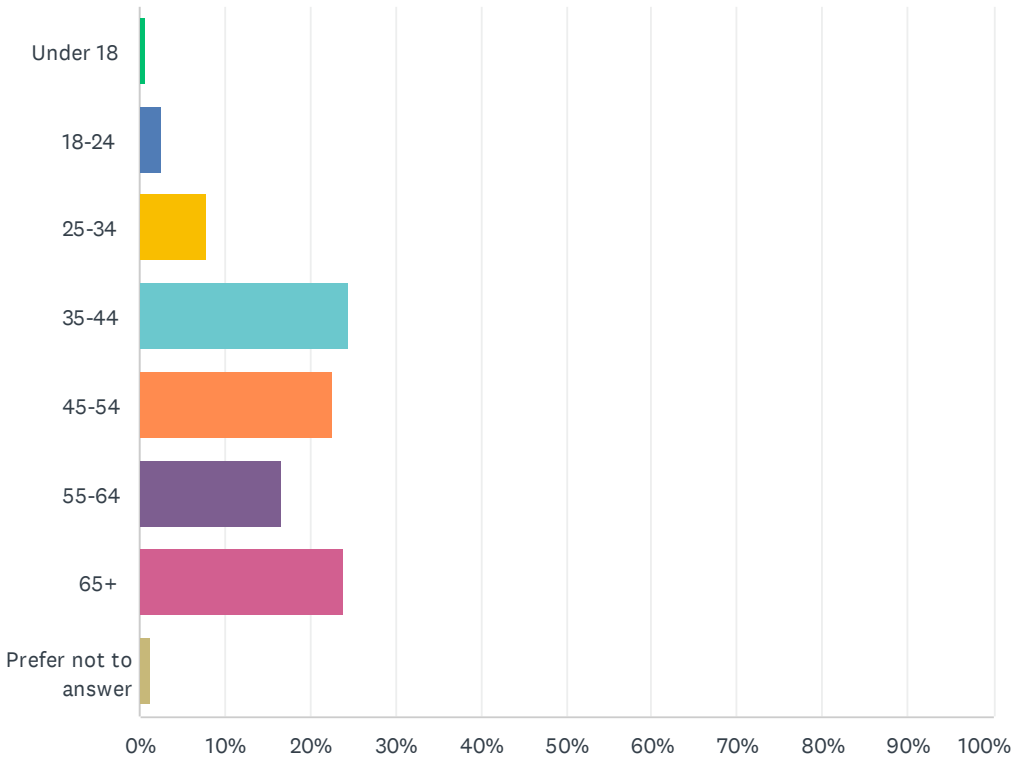
Answered: 163 Skipped: 1



ANSWER CHOICES	RESPONSES	
Live in Glendora	89.57%	146
Work in Glendora	28.22%	46
Visit Glendora, but live and work elsewhere	6.75%	11
Total Respondents: 163		

Q2 What is your age group?

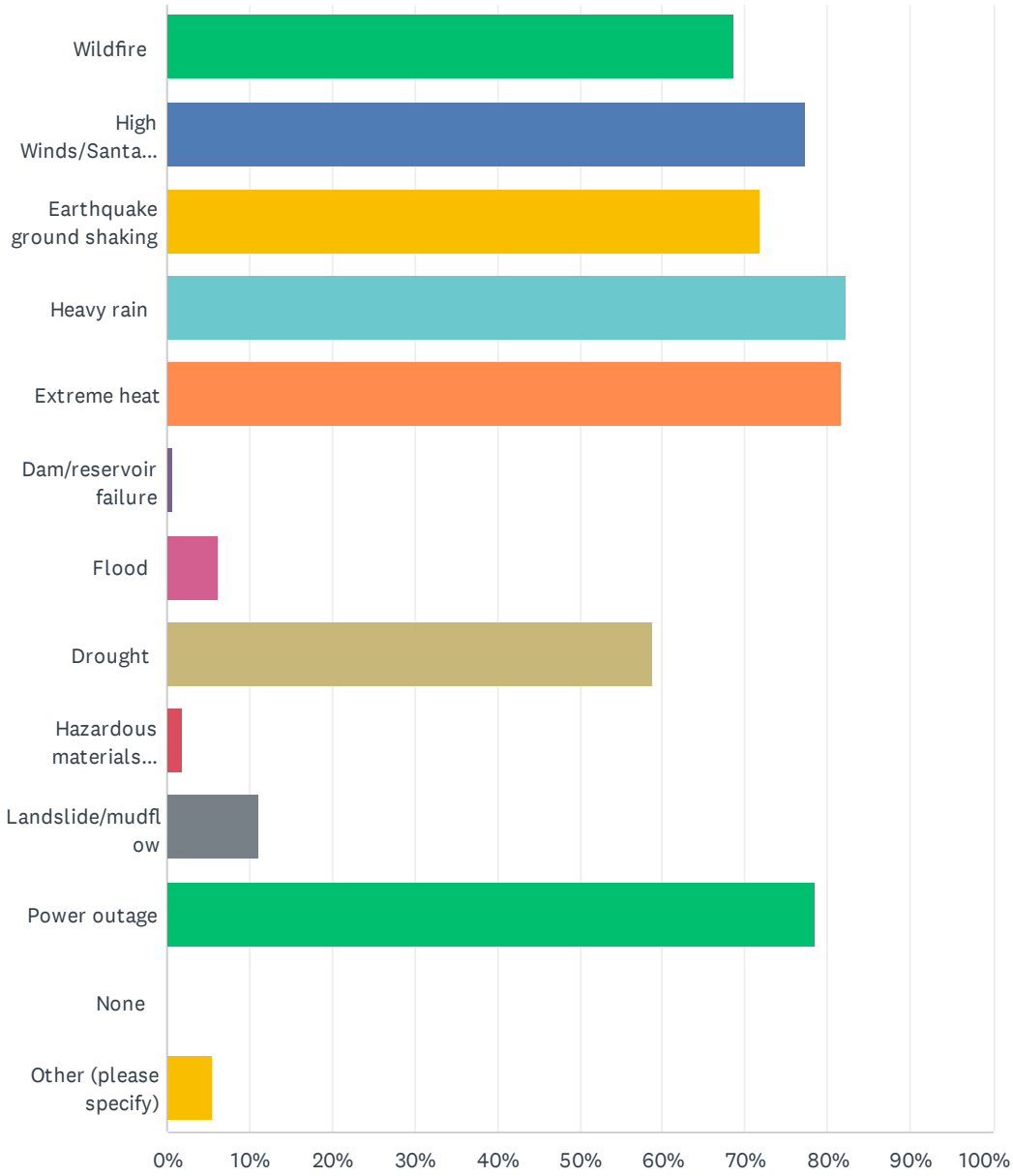
Answered: 163 Skipped: 1



ANSWER CHOICES	RESPONSES	
Under 18	0.61%	1
18-24	2.45%	4
25-34	7.98%	13
35-44	24.54%	40
45-54	22.70%	37
55-64	16.56%	27
65+	23.93%	39
Prefer not to answer	1.23%	2
TOTAL		163

Q3 Which of the following types of hazards have you or someone in your household experienced while residing and/or working in Glendora?

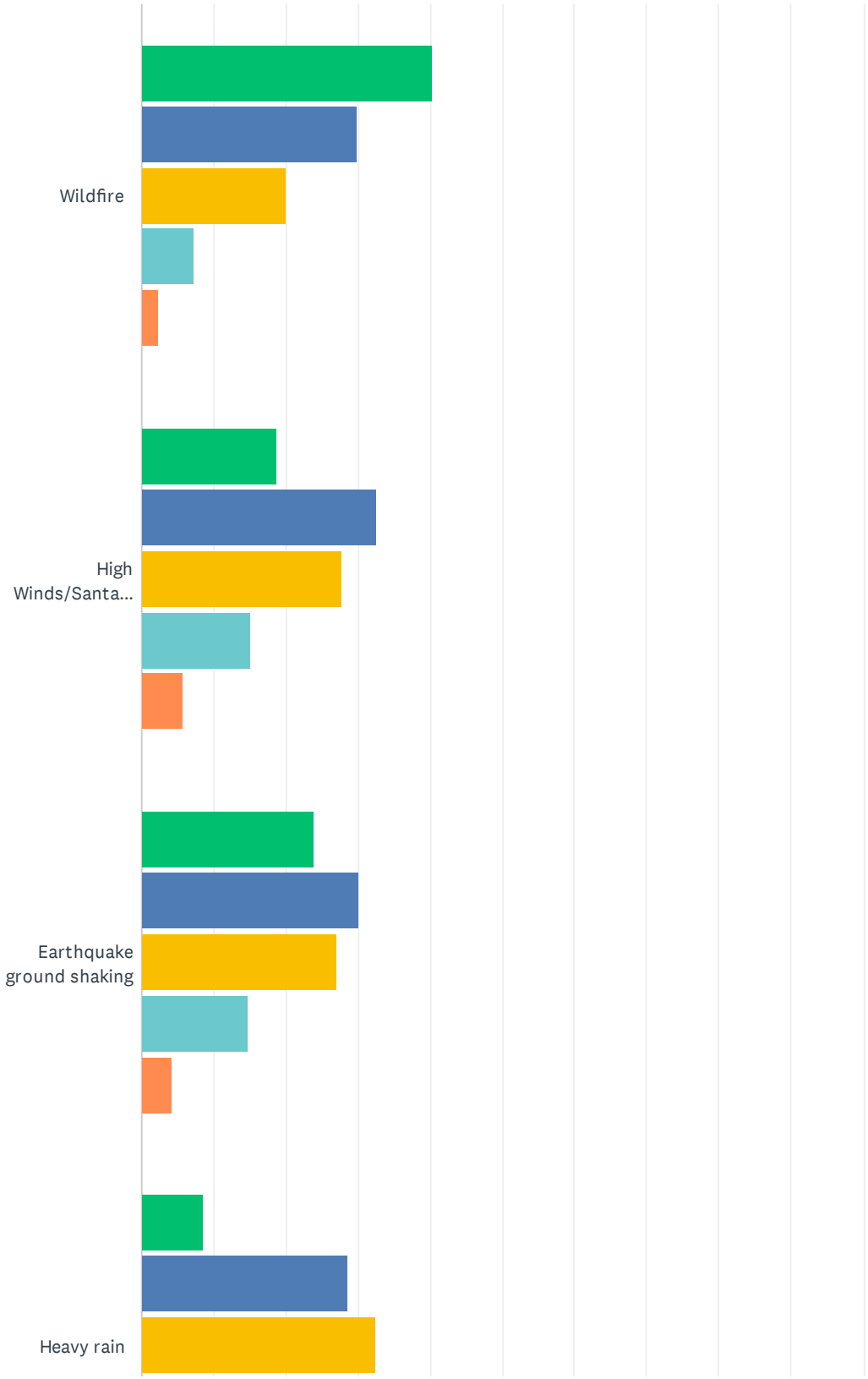
Answered: 163 Skipped: 1

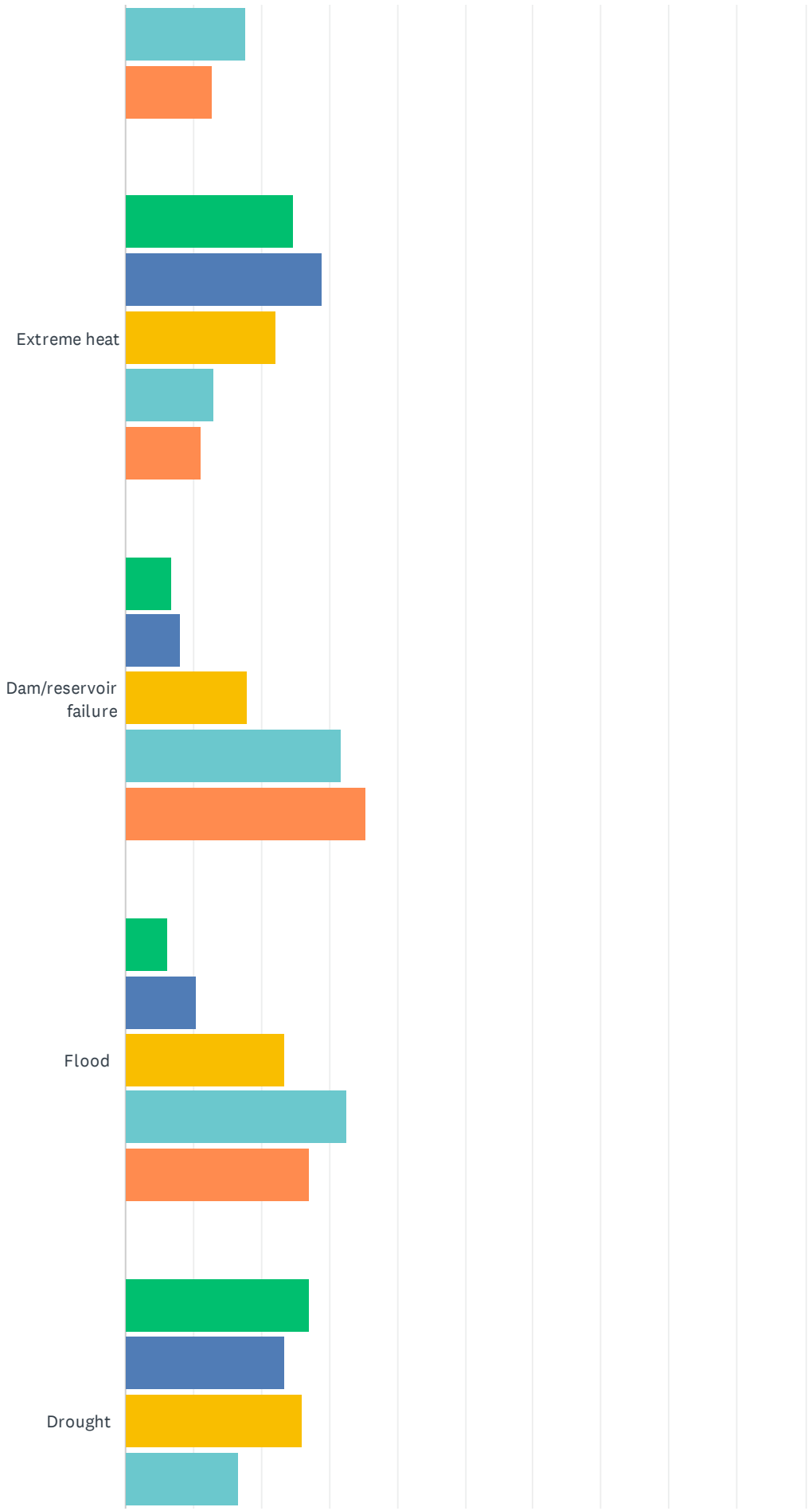


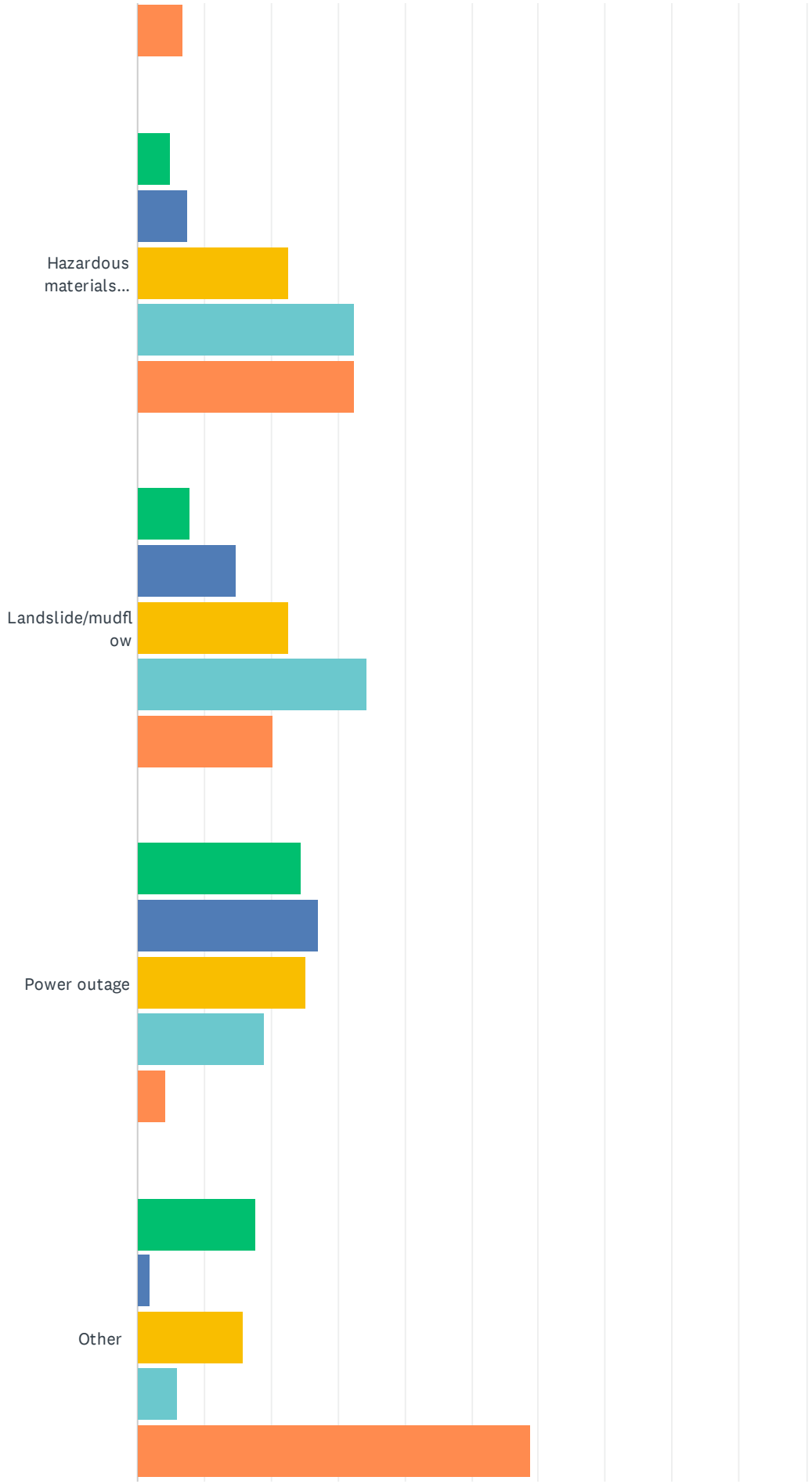
ANSWER CHOICES	RESPONSES	
Wildfire	68.71%	112
High Winds/Santa Anas	77.30%	126
Earthquake ground shaking	71.78%	117
Heavy rain	82.21%	134
Extreme heat	81.60%	133
Dam/reservoir failure	0.61%	1
Flood	6.13%	10
Drought	58.90%	96
Hazardous materials incidents/spills	1.84%	3
Landslide/mudflow	11.04%	18
Power outage	78.53%	128
None	0.00%	0
Other (please specify)	5.52%	9
Total Respondents: 163		

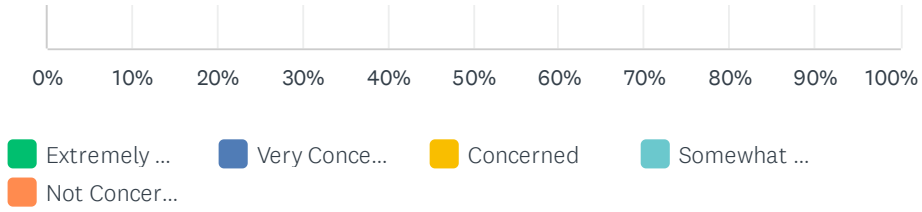
Q4 How concerned are you that the following hazards will happen in or impact Glendora? Please check ONE response for each hazard.

Answered: 164 Skipped: 0




Extreme heat
Dam/reservoir failure
Flood
Drought

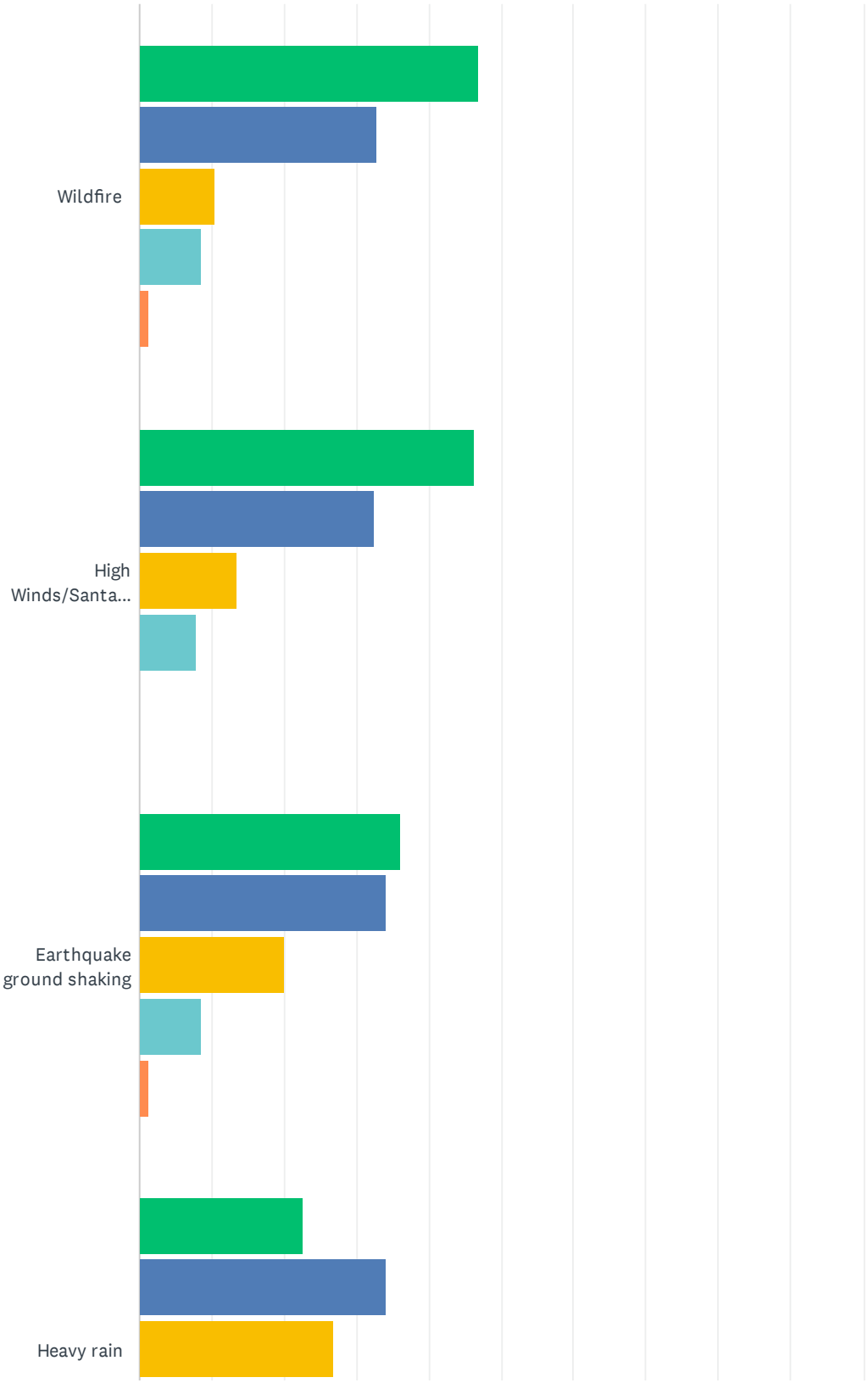

Hazardous materials...
Landslide/mudflow
Power outage
Other

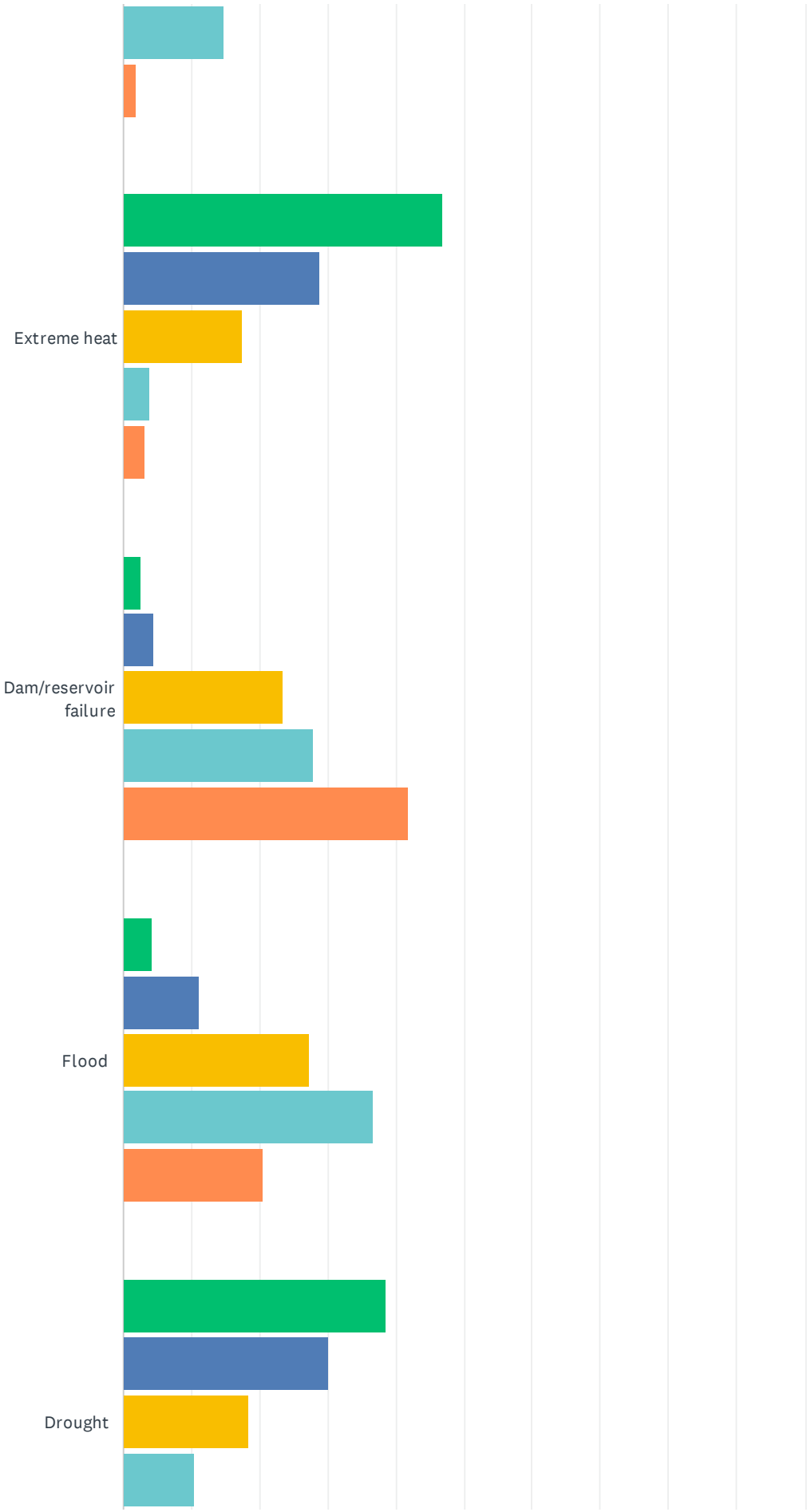


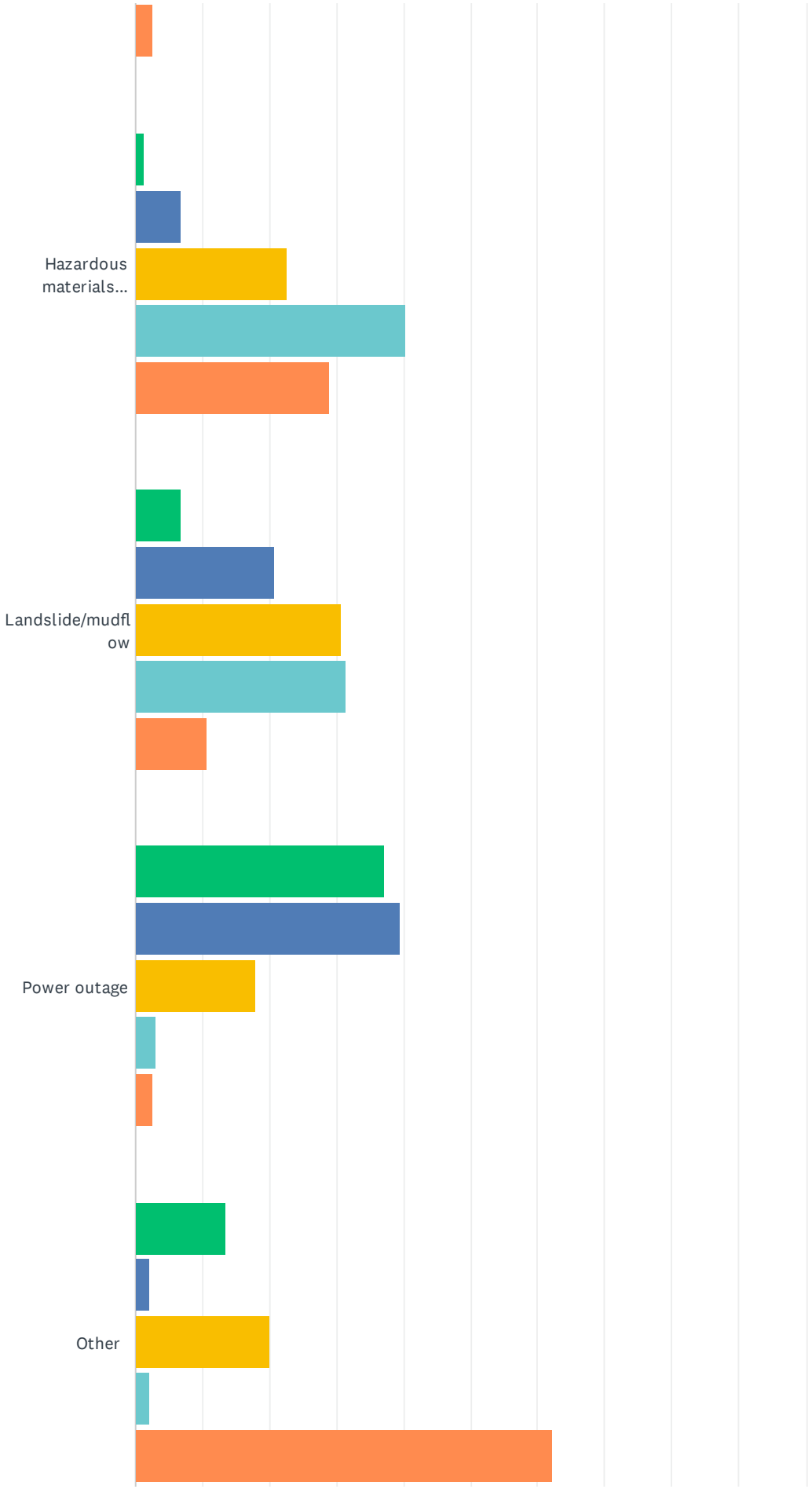
	EXTREMELY CONCERNED	VERY CONCERNED	CONCERNED	SOMEWHAT CONCERNED	NOT CONCERNED	TOTAL	WEIGHTED AVERAGE
Wildfire	40.24% 66	29.88% 49	20.12% 33	7.32% 12	2.44% 4	164	3.98
High Winds/Santa Anas	18.87% 30	32.70% 52	27.67% 44	15.09% 24	5.66% 9	159	3.44
Earthquake ground shaking	23.93% 39	30.06% 49	26.99% 44	14.72% 24	4.29% 7	163	3.55
Heavy rain	8.54% 14	28.66% 47	32.32% 53	17.68% 29	12.80% 21	164	3.02
Extreme heat	24.69% 40	29.01% 47	22.22% 36	12.96% 21	11.11% 18	162	3.43
Dam/reservoir failure	6.83% 11	8.07% 13	18.01% 29	31.68% 51	35.40% 57	161	2.19
Flood	6.17% 10	10.49% 17	23.46% 38	32.72% 53	27.16% 44	162	2.36
Drought	27.16% 44	23.46% 38	25.93% 42	16.67% 27	6.79% 11	162	3.48
Hazardous materials incidents/spills	5.00% 8	7.50% 12	22.50% 36	32.50% 52	32.50% 52	160	2.20
Landslide/mudflow	7.98% 13	14.72% 24	22.70% 37	34.36% 56	20.25% 33	163	2.56
Power outage	24.54% 40	26.99% 44	25.15% 41	19.02% 31	4.29% 7	163	3.48
Other	17.65% 9	1.96% 1	15.69% 8	5.88% 3	58.82% 30	51	2.14

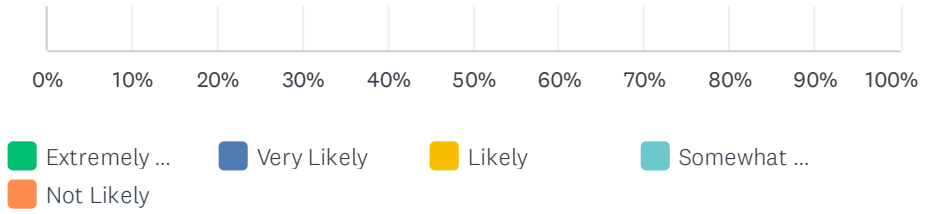
Q5 What do you believe is the likelihood that these hazards will occur in or impact the City of Glendora? Please check ONE for each hazard.

Answered: 164 Skipped: 0




Extreme heat
Dam/reservoir failure
Flood
Drought

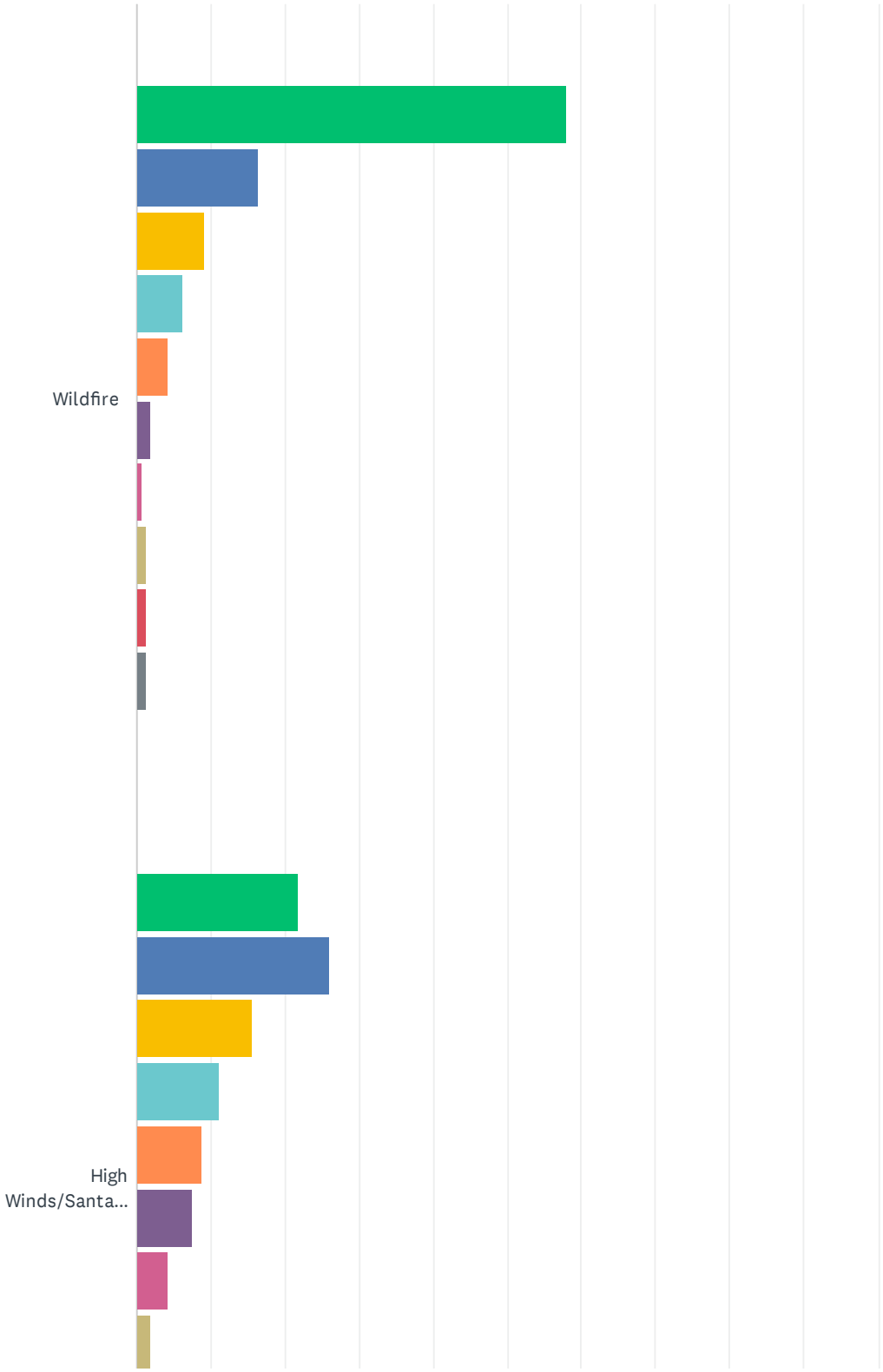

Hazardous materials...
Landslide/mudflow
Power outage
Other

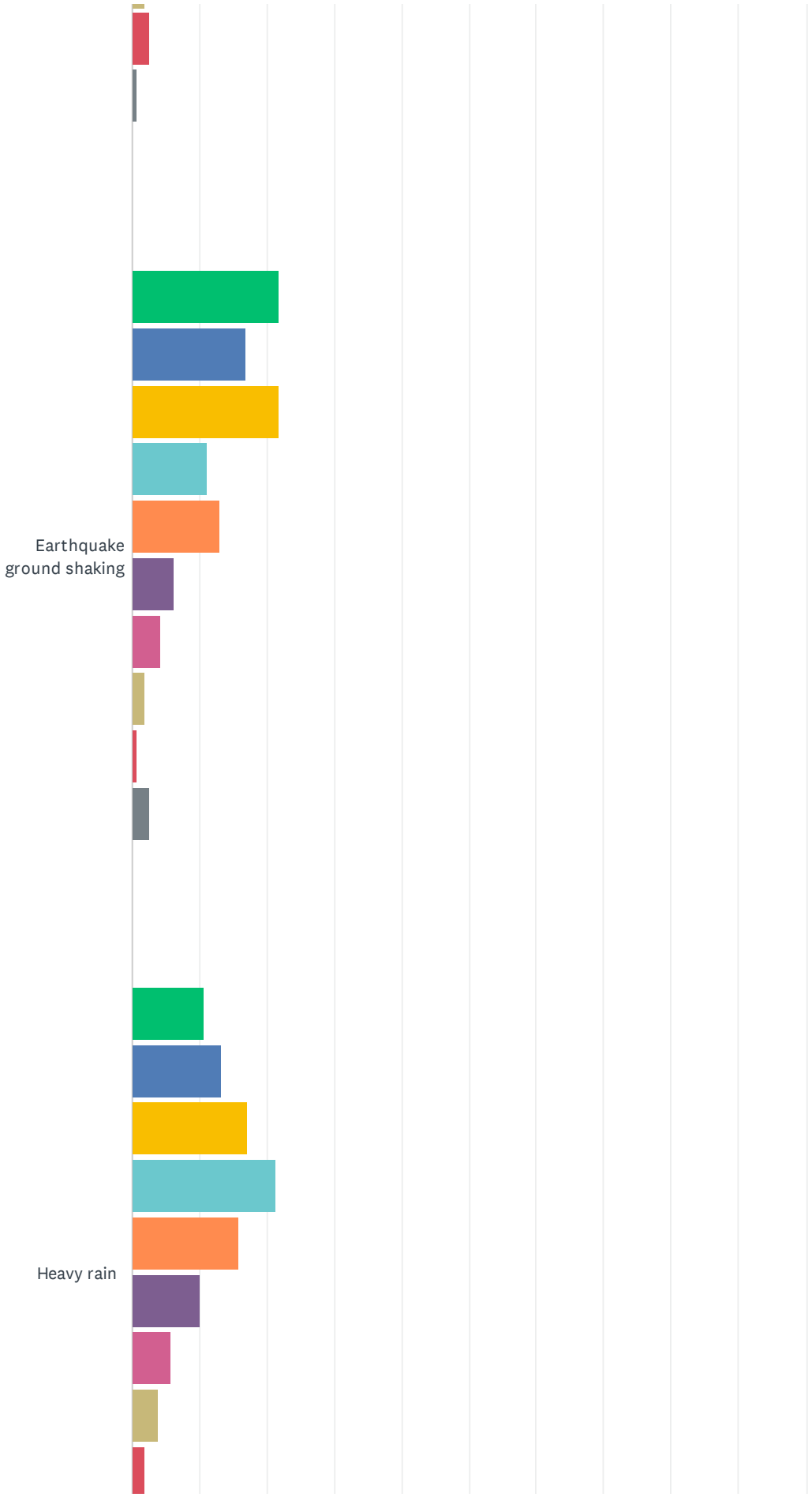


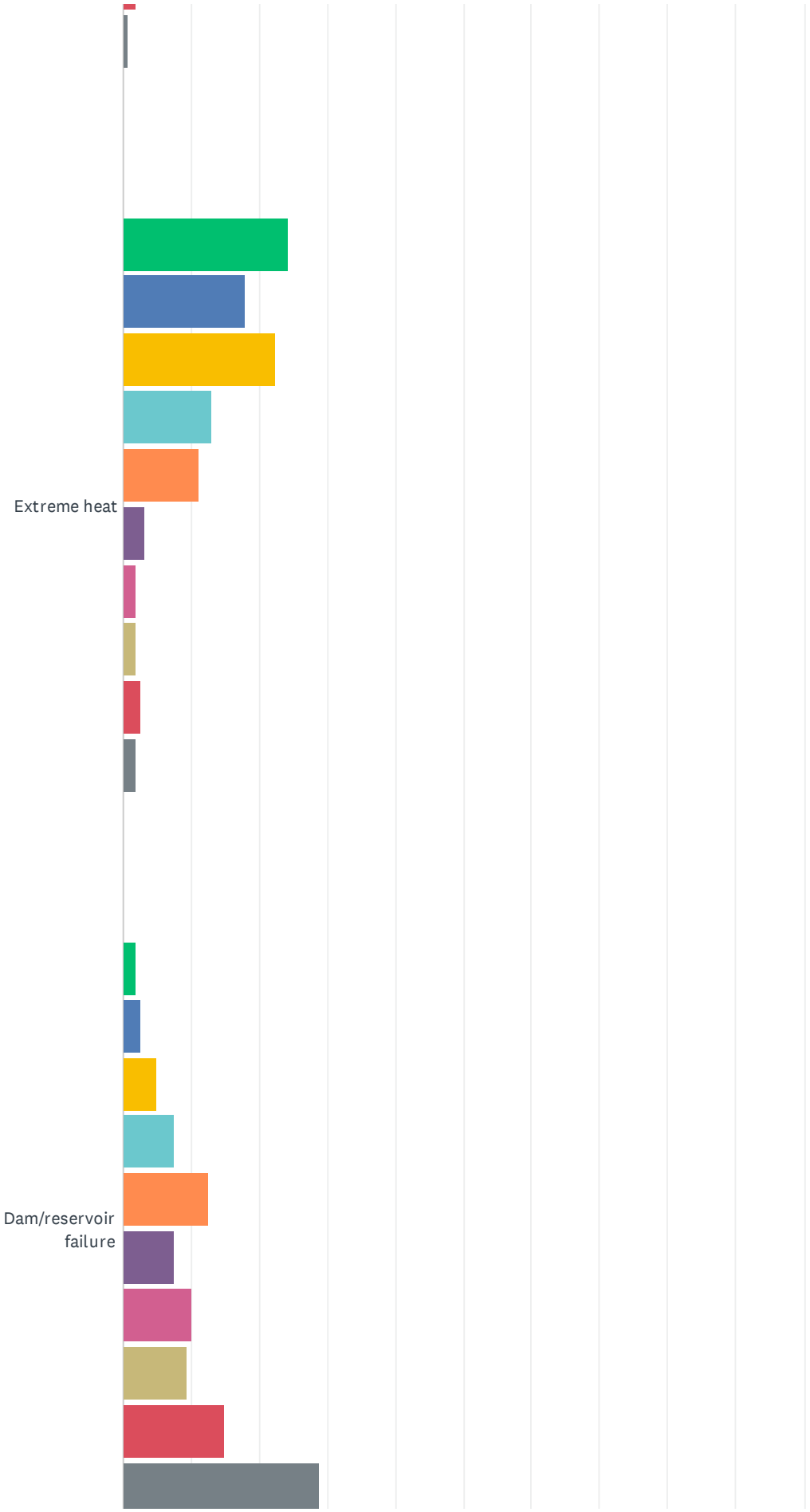
	EXTREMELY LIKELY	VERY LIKELY	LIKELY	SOMEWHAT LIKELY	NOT LIKELY	TOTAL	WEIGHTED AVERAGE
Wildfire	46.95% 77	32.93% 54	10.37% 17	8.54% 14	1.22% 2	164	4.38
High Winds/Santa Anas	46.34% 76	32.32% 53	13.41% 22	7.93% 13	0.00% 0	164	4.33
Earthquake ground shaking	35.98% 59	34.15% 56	20.12% 33	8.54% 14	1.22% 2	164	4.17
Heavy rain	22.56% 37	34.15% 56	26.83% 44	14.63% 24	1.83% 3	164	3.98
Extreme heat	46.88% 75	28.75% 46	17.50% 28	3.75% 6	3.13% 5	160	4.33
Dam/reservoir failure	2.53% 4	4.43% 7	23.42% 37	27.85% 44	41.77% 66	158	4.21
Flood	4.35% 7	11.18% 18	27.33% 44	36.65% 59	20.50% 33	161	3.98
Drought	38.65% 63	30.06% 49	18.40% 30	10.43% 17	2.45% 4	163	4.23
Hazardous materials incidents/spills	1.26% 2	6.92% 11	22.64% 36	40.25% 64	28.93% 46	159	4.08
Landslide/mudflow	6.88% 11	20.63% 33	30.63% 49	31.25% 50	10.63% 17	160	3.87
Power outage	37.04% 60	39.51% 64	17.90% 29	3.09% 5	2.47% 4	162	4.22
Other	13.33% 6	2.22% 1	20.00% 9	2.22% 1	62.22% 28	45	4.56

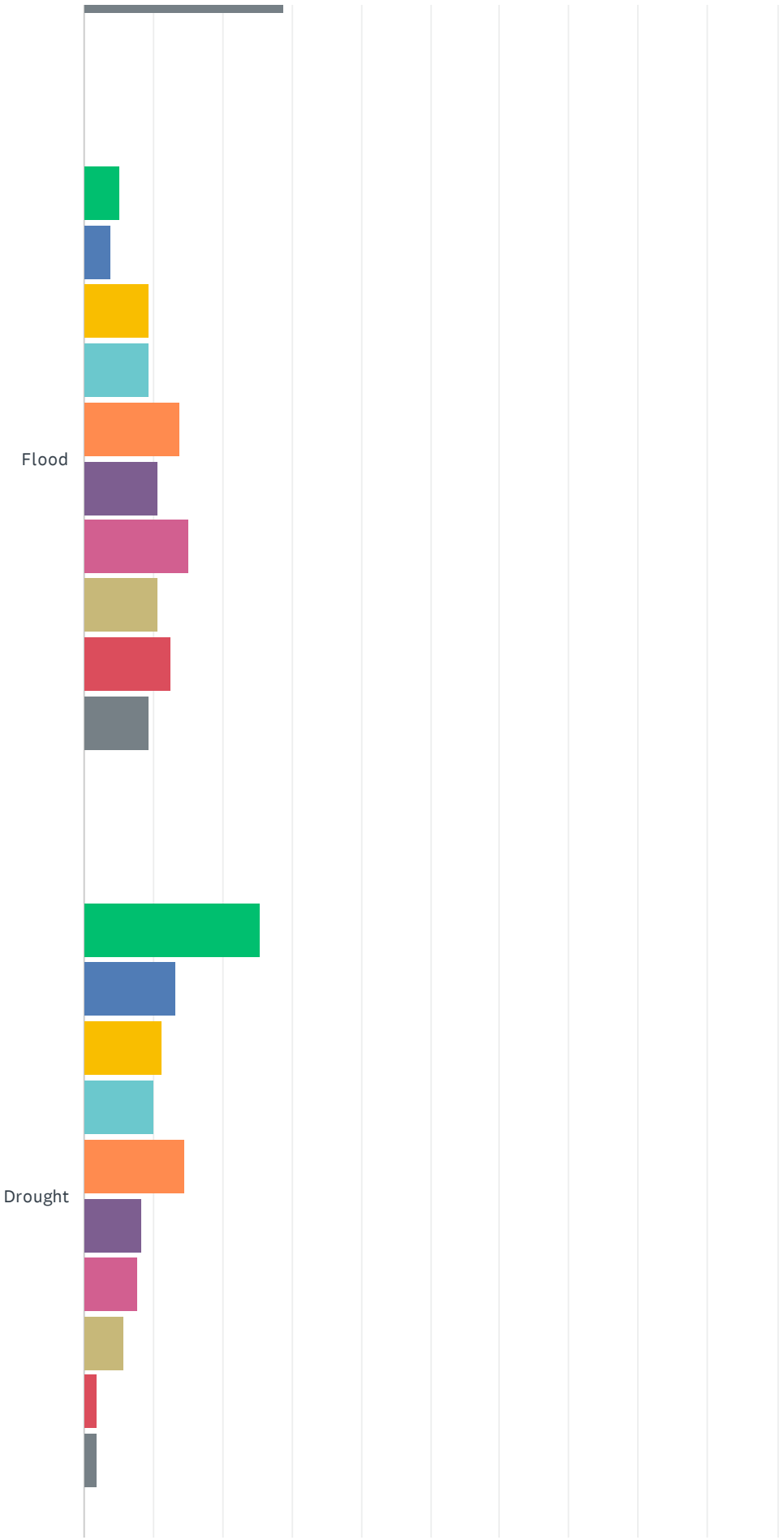
Q6 Rank the hazards based on the likelihood of potential threat to Glendora with 1 being the HIGHEST threat and 10 being the LOWEST threat.

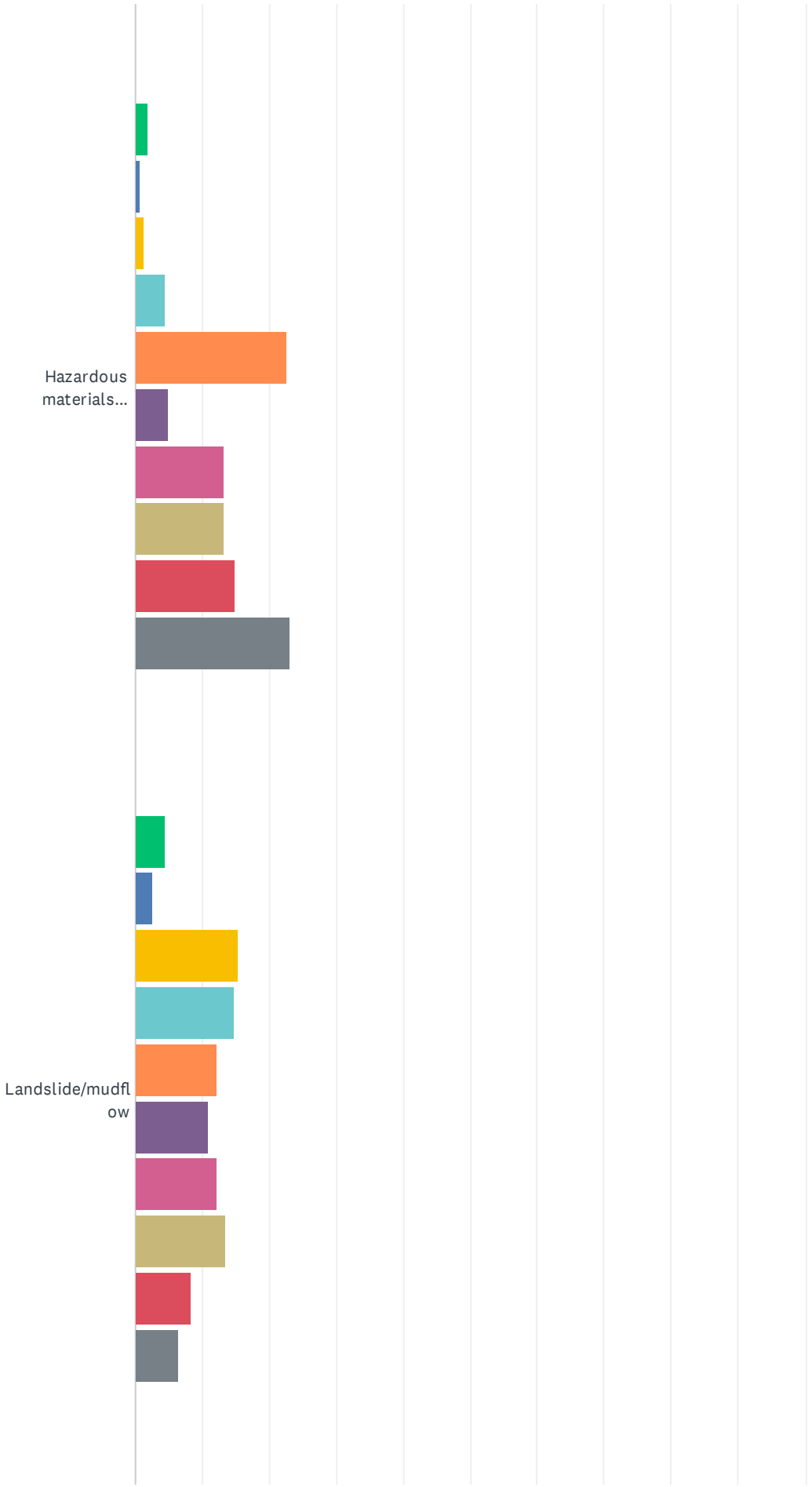
Answered: 164 Skipped: 0

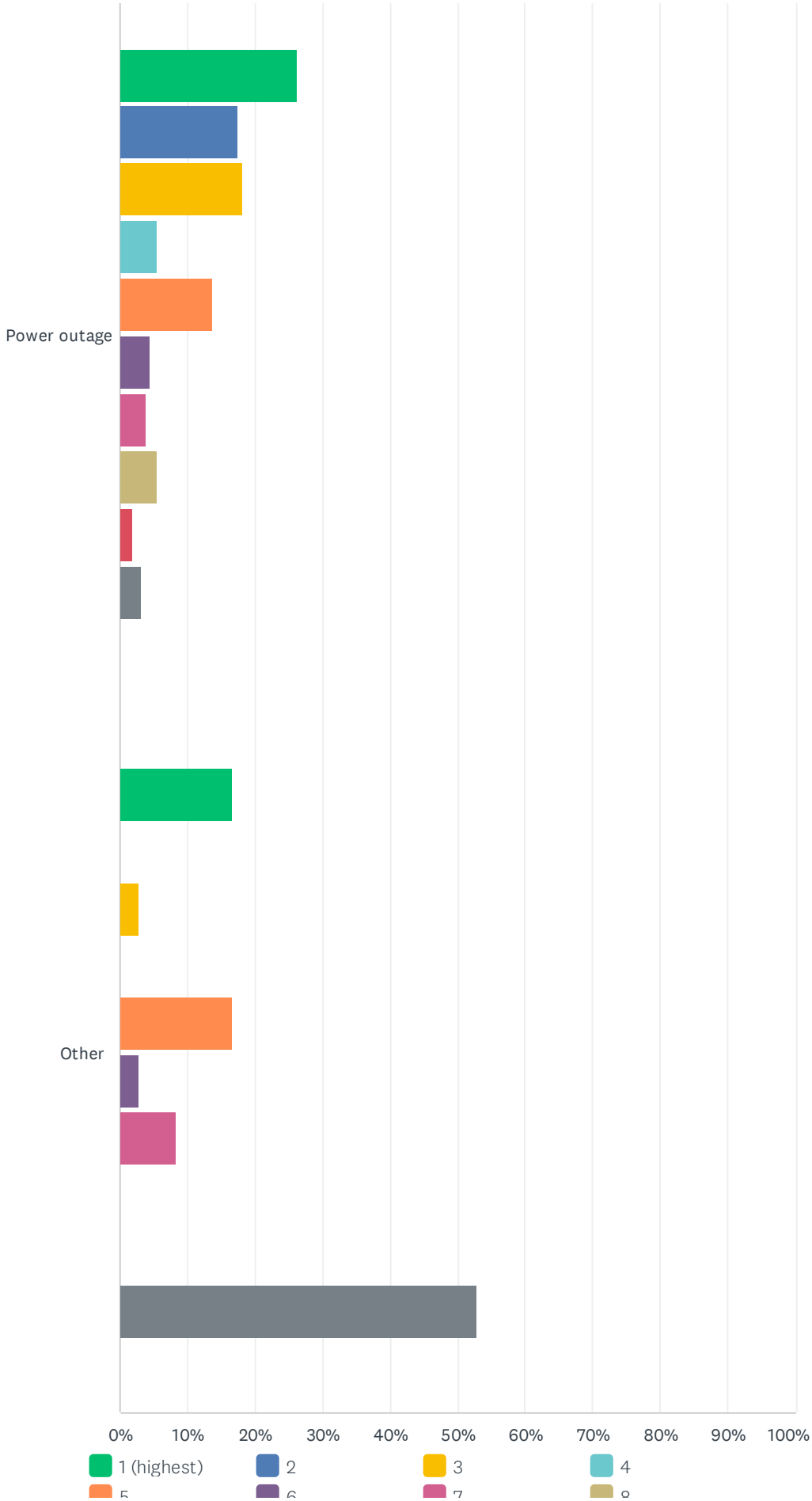



Earthquake ground shaking
Heavy rain


Extreme heat
Dam/reservoir failure


Flood
Drought


Hazardous materials...
Landslide/mudflow

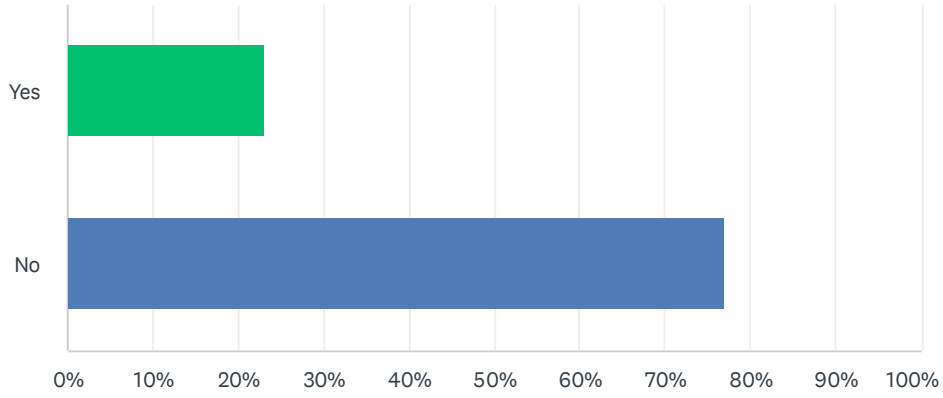

Power outage
Other
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
1 (highest)
2
3
4
5
6
7
8



	1 (HIGHEST)	2	3	4	5	6	7	8	9	10 (LOWEST)
Wildfire	57.93% 95	16.46% 27	9.15% 15	6.10% 10	4.27% 7	1.83% 3	0.61% 1	1.22% 2	1.22% 2	1.22% 2
High Winds/Santa Anas	21.74% 35	26.09% 42	15.53% 25	11.18% 18	8.70% 14	7.45% 12	4.35% 7	1.86% 3	2.48% 4	0.62% 1
Earthquake ground shaking	21.74% 35	16.77% 27	21.74% 35	11.18% 18	13.04% 21	6.21% 10	4.35% 7	1.86% 3	0.62% 1	2.48% 4
Heavy rain	10.69% 17	13.21% 21	16.98% 27	21.38% 34	15.72% 25	10.06% 16	5.66% 9	3.77% 6	1.89% 3	0.63% 1
Extreme heat	24.22% 39	18.01% 29	22.36% 36	13.04% 21	11.18% 18	3.11% 5	1.86% 3	1.86% 3	2.48% 4	1.86% 3
Dam/reservoir failure	1.88% 3	2.50% 4	5.00% 8	7.50% 12	12.50% 20	7.50% 12	10.00% 16	9.38% 15	15.00% 24	28.75% 46
Flood	5.03% 8	3.77% 6	9.43% 15	9.43% 15	13.84% 22	10.69% 17	15.09% 24	10.69% 17	12.58% 20	9.43% 15
Drought	25.32% 40	13.29% 21	11.39% 18	10.13% 16	14.56% 23	8.23% 13	7.59% 12	5.70% 9	1.90% 3	1.90% 3
Hazardous materials incidents/spills	1.88% 3	0.63% 1	1.25% 2	4.38% 7	22.50% 36	5.00% 8	13.13% 21	13.13% 21	15.00% 24	23.13% 37
Landslide/mudflow	4.46% 7	2.55% 4	15.29% 24	14.65% 23	12.10% 19	10.83% 17	12.10% 19	13.38% 21	8.28% 13	6.37% 10
Power outage	26.25% 42	17.50% 28	18.13% 29	5.63% 9	13.75% 22	4.38% 7	3.75% 6	5.63% 9	1.88% 3	3.13% 5
Other	16.67% 6	0.00% 0	2.78% 1	0.00% 0	16.67% 6	2.78% 1	8.33% 3	0.00% 0	0.00% 0	52.78% 19

Q7 Is there a hazard not listed above that you think is a wide scale threat to Glendora?

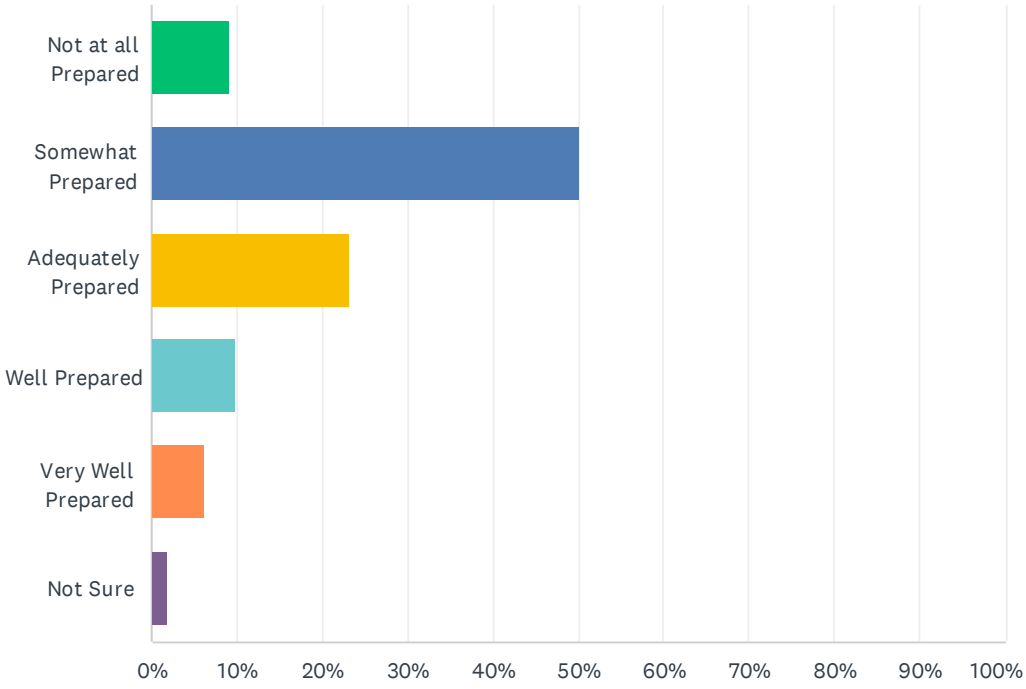
Answered: 148 Skipped: 16



ANSWER CHOICES	RESPONSES	
Yes	22.97%	34
No	77.03%	114
TOTAL		148

Q8 How prepared is your household to deal with a hazard event likely to occur in Glendora?

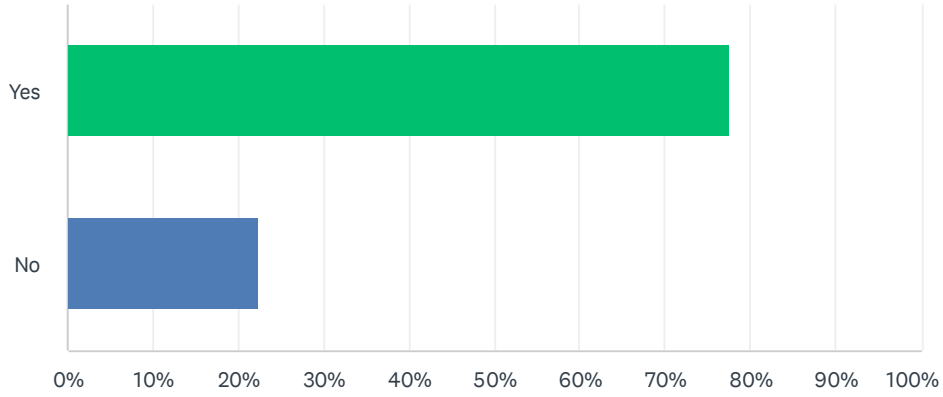
Answered: 164 Skipped: 0



ANSWER CHOICES	RESPONSES	
Not at all Prepared	9.15%	15
Somewhat Prepared	50.00%	82
Adequately Prepared	23.17%	38
Well Prepared	9.76%	16
Very Well Prepared	6.10%	10
Not Sure	1.83%	3
TOTAL		164

Q9 Have you taken actions to make your home, business, or neighborhood more resistant to hazards (such as anchored furniture and service utilities, maintain functioning smoke detectors, regularly trimmed trees, annually cut-down dry weeds to reduce fire hazards, etc.)?

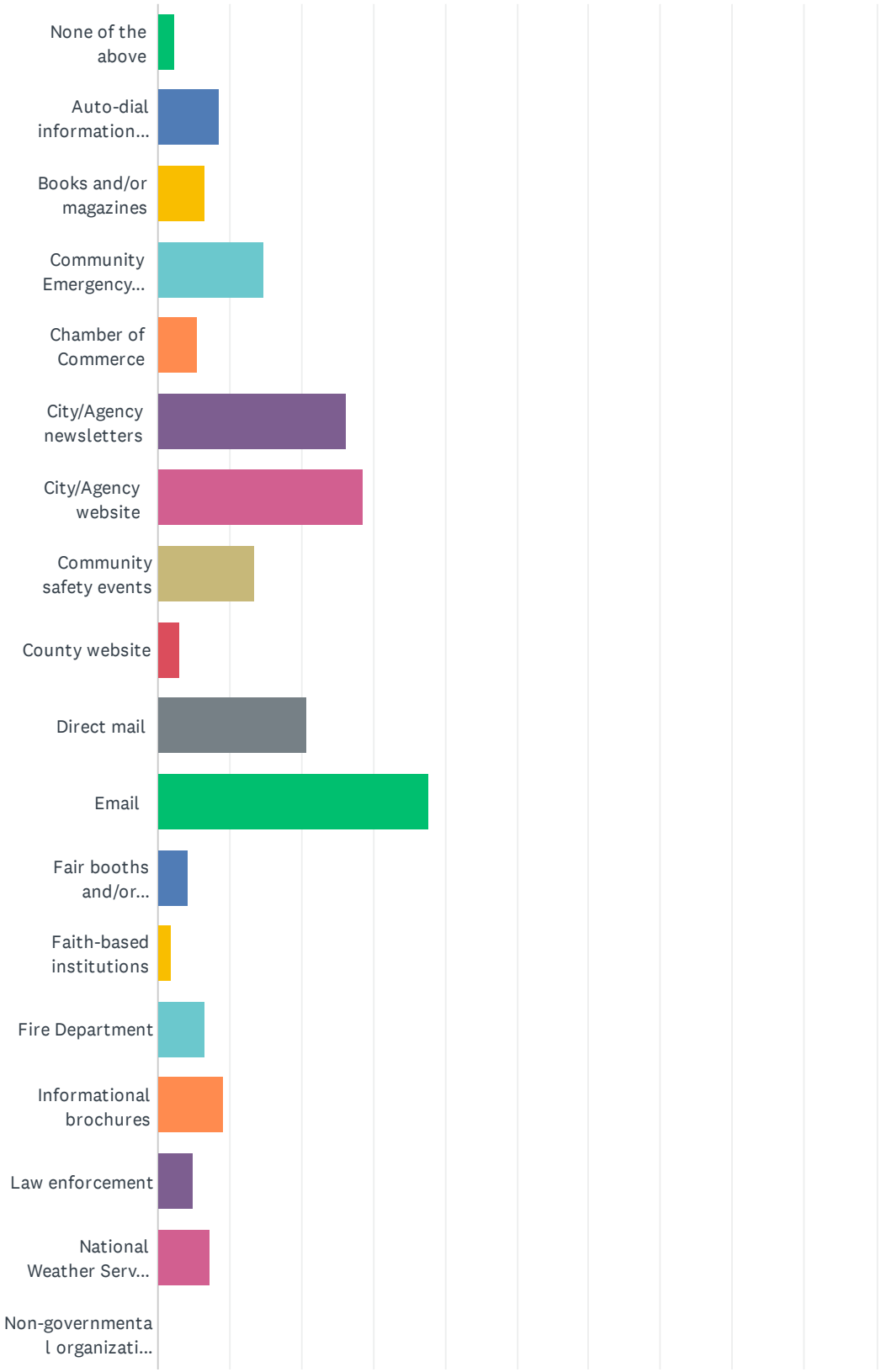
Answered: 161 Skipped: 3

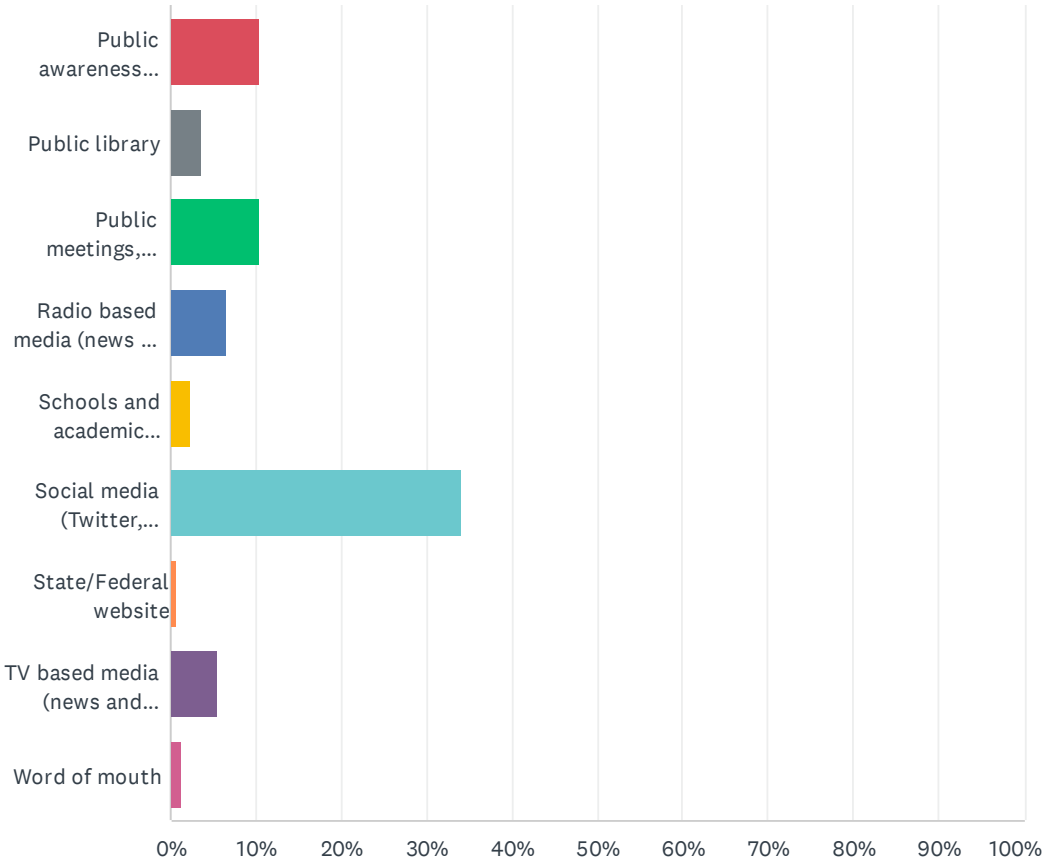


ANSWER CHOICES	RESPONSES	
Yes	77.64%	125
No	22.36%	36
TOTAL		161

Q10 Choose the top 3 ways you prefer to receive information about how to make your home and neighborhood more resistant to hazards?

Answered: 164 Skipped: 0

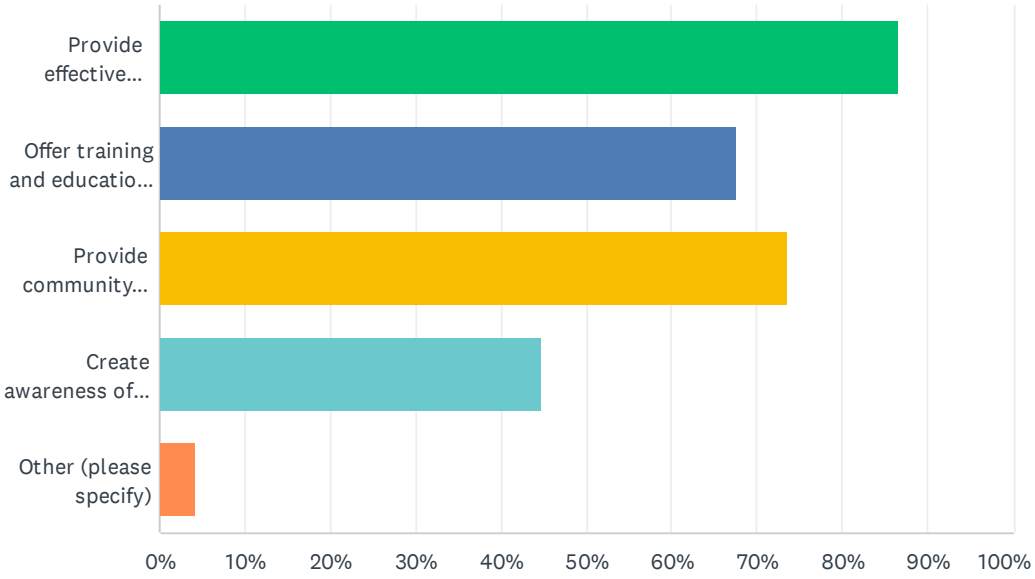



Public awareness...
Public library
Public meetings,...
Radio based media (news ...
Schools and academic...
Social media (Twitter,...
State/Federal website
TV based media (news and...
Word of mouth
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

ANSWER CHOICES	RESPONSES	
None of the above	2.44%	4
Auto-dial information from “911” center	8.54%	14
Books and/or magazines	6.71%	11
Community Emergency Response Training (CERT) classes	14.63%	24
Chamber of Commerce	5.49%	9
City/Agency newsletters	26.22%	43
City/Agency website	28.66%	47
Community safety events	13.41%	22
County website	3.05%	5
Direct mail	20.73%	34
Email	37.80%	62
Fair booths and/or festivals	4.27%	7
Faith-based institutions	1.83%	3
Fire Department	6.71%	11
Informational brochures	9.15%	15
Law enforcement	4.88%	8
National Weather Service website	7.32%	12
Non-governmental organizations (Red Cross)	0.00%	0
Public awareness campaigns (Flood Awareness Week; the Great Shakeout)	10.37%	17
Public library	3.66%	6
Public meetings, workshops, and/or classes	10.37%	17
Radio based media (news and public service announcements)	6.71%	11
Schools and academic institutions	2.44%	4
Social media (Twitter, Facebook, LinkedIn, Instagram)	34.15%	56
State/Federal website	0.61%	1
TV based media (news and public service announcements)	5.49%	9
Word of mouth	1.22%	2
Total Respondents: 164		

Q11 How can your City, County or other Agencies help you become better prepared for disaster? Choose all that apply.

Answered: 163 Skipped: 1



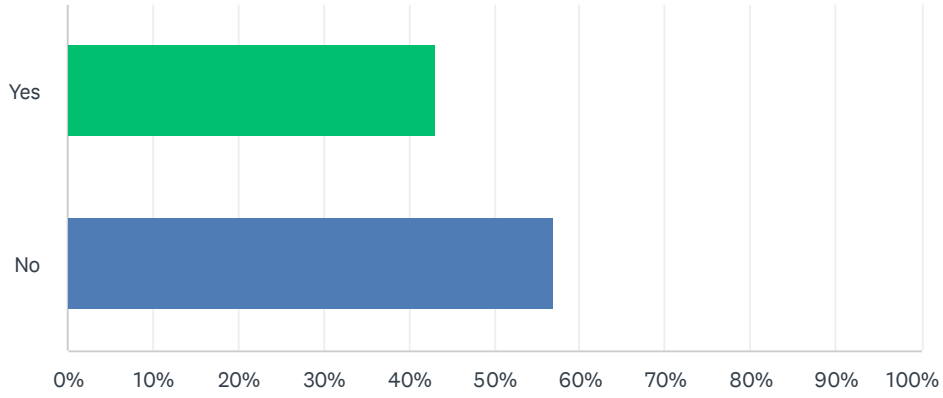
ANSWER CHOICES	RESPONSES	
Provide effective emergency notifications and communications in a disaster	86.50%	141
Offer training and education to residents and business owners on how to reduce risk	67.48%	110
Provide community outreach regarding emergency preparedness and evacuation procedures	73.62%	120
Create awareness of special needs and vulnerable populations	44.79%	73
Other (please specify)	4.29%	7
Total Respondents: 163		

Q12 Please utilize the space below to provide any additional comments regarding local hazards, disasters, and preparedness.

Answered: 21 Skipped: 143

Q13 Would you like to review and comment on the drafts of the Glendora Local Hazard Mitigation Plan and Safety Element?

Answered: 158 Skipped: 6

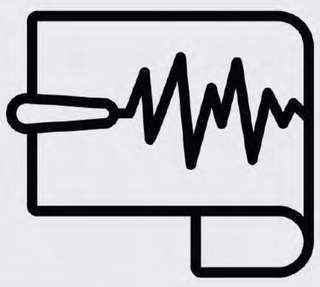


ANSWER CHOICES	RESPONSES	
Yes	43.04%	68
No	56.96%	90
TOTAL		158



SAFETY ELEMENT UPDATE AND LOCAL HAZARD MITIGATION PLAN

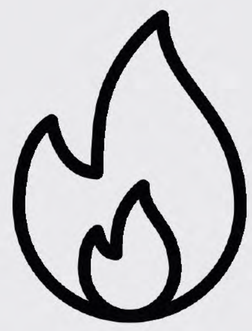
THE CITY IS ASSESSING ITS VULNERABILITY TO NATURAL AND MANMADE HAZARDS AND NEEDS YOUR INPUT ON TOPICS SUCH AS:



SEISMIC HAZARDS



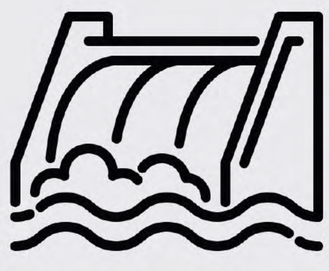
FLOOD & DROUGHT



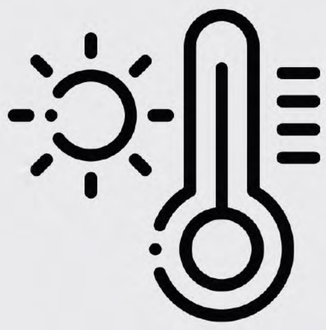
WILDFIRE



LANDSLIDE & MUDFLOW



DAM/RESERVOIR FAILURE



SEVERE WEATHER

TO LEARN MORE AND SHARE YOUR INPUT, VISIT:
HTTPS://WWW.CITYOFGLENDORA.ORG/DEPARTMENTS/COMMUNITY-DEVELOPMENT/ADVANCED-PLANNING-COMMUNITY-ENGAGEMENT

EMERGENCY KIT

RAFFLE

Enter Now!

Supplies!
Gift card!

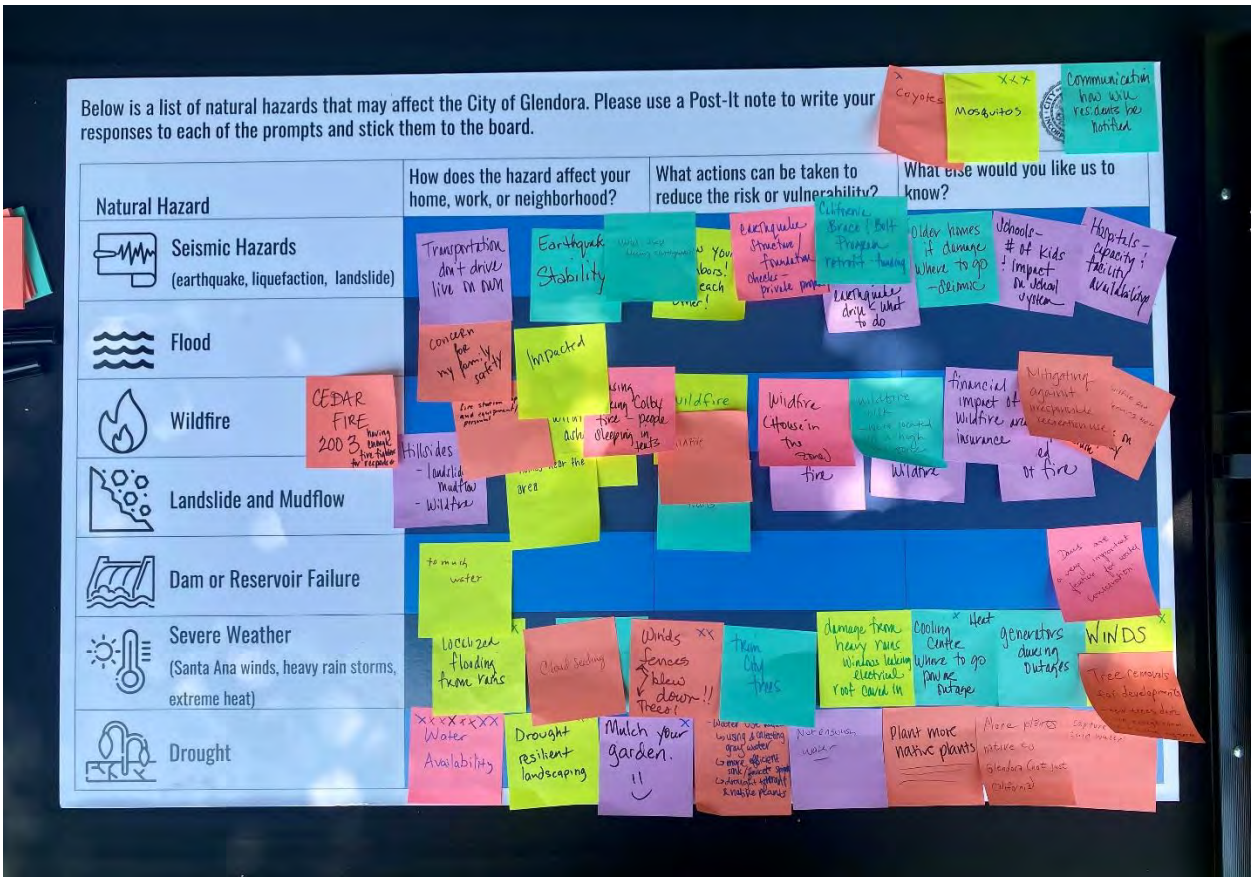


Below is a list of natural hazards that may affect the City of Glendora. Please use a Post-It note to write your responses to each of the prompts and stick them to the board.

Natural Hazard	How does the hazard affect your home, work, or neighborhood?	What actions can be taken to reduce the risk or vulnerability?	What else would you like us to know?
Seismic Hazards (earthquake, liquefaction, landslide)			
Flood			
Wildfire			
Landslide and Mudflow			
Dam or Reservoir Failure			
Severe Weather (Santa Ana winds, heavy rain storms, extreme heat)			
Drought			


EMERGENCY KIT
RAFFLE
Enter Now!


READYWISE
EMERGENCY
FOOD SUPPLY
SAFETY LIGHT STICK
Booda Brand
Anti Tip Metal
Furniture Anchor
10
PACK

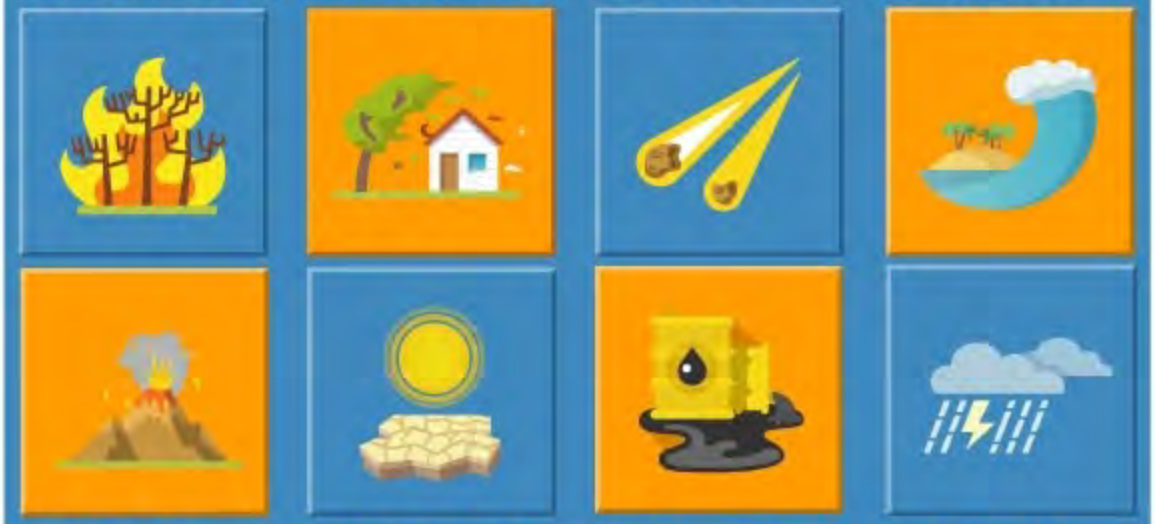

Below is a list of natural hazards that may affect the City of Glendora. Please use a Post-It note to write your responses to each of the prompts and stick them to the board.
Natural Hazard
How does the hazard affect your home, work, or neighborhood?
What actions can be taken to reduce the risk or vulnerability?
What else would you like us to know?
Seismic Hazards
(earthquake, liquefaction, landslide)
Flood
Wildfire
Landslide and Mudflow
Dam or Reservoir Failure
Severe Weather
(Santa Ana winds, heavy rain storms, extreme heat)
Drought
Coyotes
Mosquitos
Communication how will residents be notified
Transportation don't drive live on own
Earthquake Stability
Impacted
CEDAR FIRE 2003
Hillsides - landslide mudflow - wildfire
Wildfire
Wildfire (House in the zone)
Wildfire
Financial impact of wildfire and insurance
Mitigating against irresponsible recreation use
Localized flooding from rains
Cloud seeding
Winds fences blew down!! Trees!
Trim City trees
damage from heavy rains windows leaking electrical roof caved in
Cooling Center where to go power outage
generators during outages
WINDS
Water Availability
Drought resilient landscaping
Mulch your garden.
Plant more native plants


RAFFLE





DISASTER HAPPENS ARE YOU READY?



THE PREPARE FAIR

GLENDORA EMERGENCY PREPAREDNESS DAY | THURSDAY, SEPTEMBER 14TH | 3PM - 7PM

PREPAREDNESS TIPS

EMERGENCY VEHICLES • PET PREPAREDNESS • HAM RADIOS • FIRE ALARMS
KNOW YOUR EVACUATION ZONE • HANDS ONLY CPR • UTILITIES & MORE!

FEATURED

Glendora Police Dept. • SCE • Falck Ambulance LA County Fire Dept • CERT • Red Cross • CA Dept. of Forestry • GEARS• Inland Valley Humane Society • Emanate Health • Glendora Library • LA County Dept of Health • Dept. of Insurance

PRESENTATIONS

3:30 - 4:30 Pillowcase Project (Elementary Kids) by Red Cross
4:45 - 5:15 Fire Safety by LA County Forestry
5:30 - 6:00 Basic Emergency Preparedness by Glendora CERT
6:15 - 6:45 Safer from Wildfires by Dept. of Insurance

SEPTEMBER 14TH | 3PM - 7PM

JOIN US! CIVIC CENTER PARKING LOT116 E. FOOTHILL BLVD (BEHIND CITY HALL)






TAKE THE SURVEY HERE:
HTTPS://WWW.SURVEYMONKEY.COM/R/FPNX2TK
SAFETY ELEMENT UPDATE AND LOCAL HAZARD MITIGATION PLAN
THE CITY IS ASSESSING ITS VULNERABILITY TO NATURAL AND MANMADE HAZARDS AND NEEDS YOUR INPUT ON TOPICS SUCH AS:
SEISMIC HAZARDS
FLOOD & DROUGHT
WILDFIRE
LANDSLIDE & MUDFLOW
DAM/RESERVOIR FAILURE
SEVERE WEATHER
TO LEARN MORE AND SHARE YOUR INPUT, VISIT:
HTTPS://WWW.CITYOFGLENDORA.ORG/DEPARTMENTS/COMMUNITY-DEVELOPMENT/ADVANCED-PLANNING-COMMUNITY-ENGAGEMENT






THE PREPARE FAIR
PRESENTATIONS in BIDWELL FORUM
3:30pm - 4:30pm
Pillowcase Project (Elementary Kids) by Red Cross
4:45pm - 5:15pm
Fire Safety by LA County Fire Department
5:30pm - 6:00pm
Basic Emergency Preparedness by Glendora CERT
6:15pm - 6:45pm
Safer from Wildfires by Dept. of Insurance
GLENDORA EMERGENCY PREPAREDNESS DAY | THURSDAY, SEPTEMBER 14TH | 3PM - 7PM
Restrooms Available in the Library Lobby




WATER CONSERVATION
EDISON




FALCK


COMMUNITY EMERGENCY RESPONSE TEAM
CERT
COMMUNITY EMERGENCY RESPONSE TEAM

City of Glendora

COMMUNITY MEETING

The City is preparing an update to their **Local Hazard Mitigation Plan** and needs your input!

APRIL 17, 2024
10:30 AM

CHARTER OAK UNIFIED SCHOOL DISTRICT
STUDENT AND FAMILY RESOURCE CENTER
303 S. Glendora Ave.
Covina, CA 91724

The Local Hazard Mitigation Plan will identify and assess the City's vulnerability to natural and manmade hazards such as:



Seismic



Flood & Drought



Wildfire



Severe Weather

and will identify specific actions that can be taken to reduce the risk from the hazards. At the meeting, you'll have the opportunity to share your concerns, ideas, and suggestions related to hazards in the City.

Learn More

To learn more, visit the City's website at:
https://www.cityofglendora.org

Ciudad de Glendora

JUNTA COMUNITARIA

¡El Ayuntamiento está preparando la actualización de su **Plan Local de Mitigación de Peligros** y necesita su opinión!

17 DE ABRIL, 2024
10:30 AM

DISTRITO ESCOLAR UNIFICADO DE CHARTER OAK
CENTRO DE RECURSOS PARA ESTUDIANTES Y FAMILIAS
303 S. Glendora Ave.
Covina, CA 91724

El Plan Local de Mitigación de Peligros identificará y evaluará la vulnerabilidad de la Ciudad a peligros naturales y los causados por el hombre tales como:

- **Sísmos**
- **Inundaciones y sequías**
- **Incendios forestales**
- **Clima severo**

e identificará las medidas específicas que pueden tomarse para reducir el riesgo de estos peligros. En la junta, tendrá la oportunidad de compartir sus preocupaciones, ideas y sugerencias relacionadas con los peligros que ponen en riesgo a la ciudad.

Más información

Para obtener más información, visite el sitio web de la Ciudad en:

https://www.cityofglendora.org

Hazard Planning in Glendora

Focus Group Meetings

April 2024

CityOfGlendora.org

Agenda

- Introductions
- Meeting Purpose
- What is a LHMP?
- Discussion
- How You Can Help

Introductions

Name

Fun Fact



Purpose of Our Meeting Today

We want to know YOUR experience with and thoughts about hazards in Glendora

Hazard Examples



Earthquakes



Lighting Storms



Wildfires



Pests



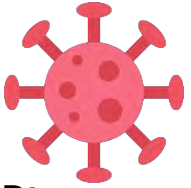
Landslides



Extreme Heat



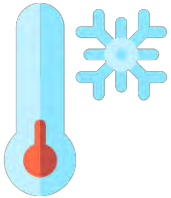
Windstorms



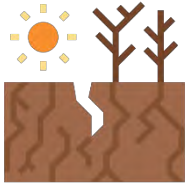
Disease



Floods



Extreme Cold



Drought



Cyber Attacks

What is a LHMP?

Local:	Specifically for the City of Glendora
Hazard:	Identifies hazards, likelihood of occurring, and community's risk/vulnerability to the hazard
Mitigation:	Finds ways to lessen the risks/vulnerabilities and make the hazards less harmful
Plan:	Identify long-term policies and actions to increase resilience and reduce vulnerabilities

Why is the City Preparing a LHMP?

01

Make the community more “disaster resistant”

02

Understand threats and hazards, including risks and community’s vulnerability to risks

03

Maintain eligibility for federal emergency funds



Discussion

Hazards Identified



Earthquakes



Heavy Rain Storms



Wildfires



Landslides/Mudflow



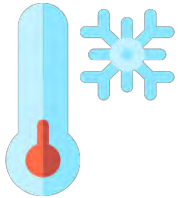
Extreme Heat



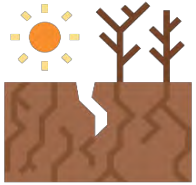
Santa Ana Winds



Floods & Dam Failure



Extreme Cold



Drought

Discussion Questions

Do you have any personal experiences with these hazards in Glendora?

What are the most likely types of hazards that could affect you and do you feel prepared for them?

Do you know where to go and what to do in an emergency?

Do you know where to find information about hazards and emergencies in Glendora?

What is your biggest concern about any of these hazards or in an emergency?

Are there any hazards missing from the list that we should consider in Glendora?

How You Can Help



By participating today!



Provide feedback on the Draft Plan:

https://www.cityofglendora.org/departments/community-development/advanced-planning-community-engagement



Send comments and questions to:

Julie Linger

jlinger@glendorapd.org

How We Use Your Input

1. Input from today's meeting helps us inform and create the Draft Plan

2. We share the Draft Plan with you for additional input

3. We revise the Draft Plan based on your feedback and share it with:
   - ✓ California Governor's Office of Emergency Services
   - ✓ Federal Emergency Management Agency
   - ✓ Glendora City Council

Timeline

- Draft Plan for Public Review
  - Anticipated late Summer/early Fall
- Revise Draft Plan and submit to Cal OES/FEMA
  - Anticipated late Fall/early 2025
- Final Plan for City Council Adoption
  - Anticipated Spring/Summer 2025



Thank You!

For additional information and updates:

https://www.cityofglendora.org/departments/community-development/advanced-planning-community-engagement

Emergency preparedness website:

https://www.cityofglendora.org/departments-services/police/emergency-preparedness

Smart911: Create a profile at
https://www.smart911.com/smart911/ref/reg.action?pa=glendorapd

What is the LHMP Planning Process?

LHMP PROCESS



LHMP PROCESS – RISK ASSESSMENT

Identify & Describe Hazards

- Location
- Extent
- Previous occurrence
- Probability of future events

Identify Community Assets

- People
- Structures
- Community lifelines and critical facilities
- Natural, historic and cultural resources
- Economy/activities that have value to the community

Analyze Impacts

- Identify risks – exposure analysis
- Describe asset vulnerabilities
- Describe potential impacts
- Estimated losses
- Repetitive and severe repetitive loss properties

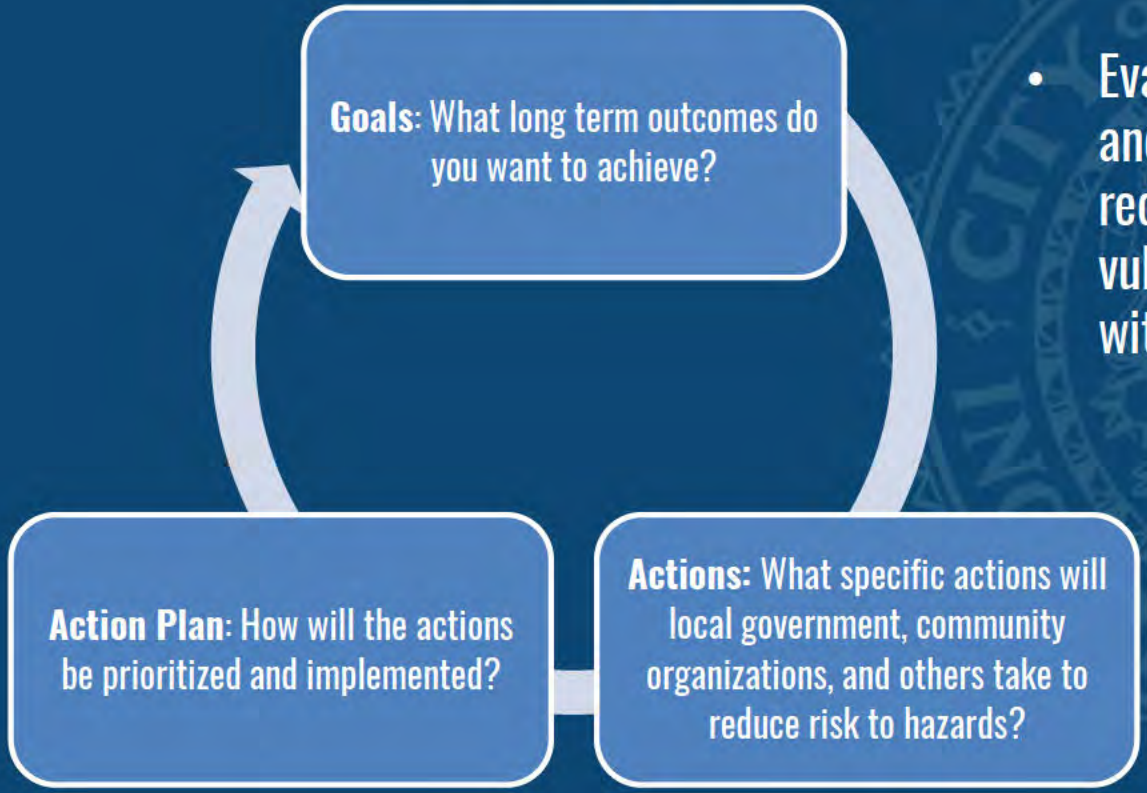
Summarize Vulnerability

- Structures
- Systems
- Populations

IDENTIFY COMMUNITY ASSETS

- Assets are anything important to the character and function of a community
  - People, including underserved communities and socially vulnerable populations
  - Structures, including new and existing buildings
  - Community lifelines and other critical facilities
  - Natural, historic and cultural resources
  - Economy and other activities that have value to the community

Mitigation Strategy



- Evaluate and prioritize goals and mitigation actions to reduce or avoid long-term vulnerabilities associated with each hazard

Mitigation Examples 1

- Local plans and regulations
  - General Plan
  - Zoning ordinances
  - Subdivision regulations
  - Building codes
  - Capital improvement programs
- Structure and infrastructure projects
  - Acquisition, relocation, elevation of flood-prone structures
  - Levees and floodwalls
  - Seismic retrofitting
  - Strengthening critical facilities
  - Burying utility lines
  - Stormwater diversion, retention, or detention

Mitigation Examples 2

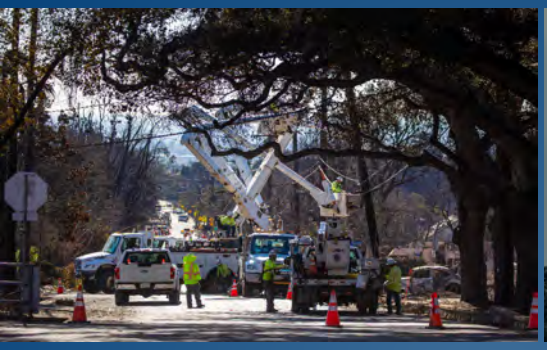
- Natural Systems Protection
  - Floodplain protection
  - Wetlands preservation
  - Coastal or riverine setbacks
  - Sediment and erosion control
  - Forest and vegetative management
- Education and Awareness Programs
  - Risk communication
  - Community events
  - Brochures/written materials
  - Website with maps/information
  - Educational programs

APPENDIX E

COUNTY OF LOS ANGELES' ALL-HAZARDS MITIGATION PLAN

2025 County of Los Angeles All-Hazards Mitigation Plan

Chief Executive Office - Office of Emergency Management









Acknowledgement

The Los Angeles County Board of Supervisors gratefully acknowledges the following agencies/jurisdictions who contributed to the development of this plan.

County Departments

Aging and Disabilities
Chief Executive Office
Chief Sustainability Office
Beaches and Harbors
Economic Opportunity
Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

Cover Photo Credits: Los Angeles County Chief Executive Office, Countywide Communications Branch; Los Angeles County Department of Public Works

Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

9/9/25
Date

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1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team
	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

County of Los Angeles
All-Hazards Mitigation Plan

Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview



Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use



Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

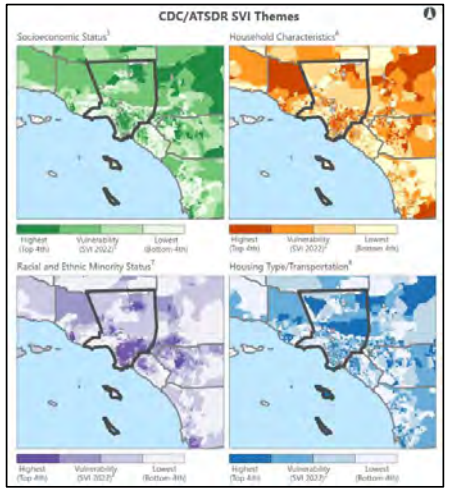


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

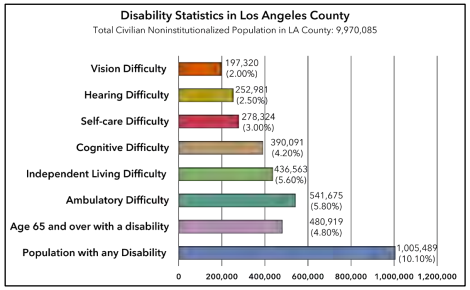


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

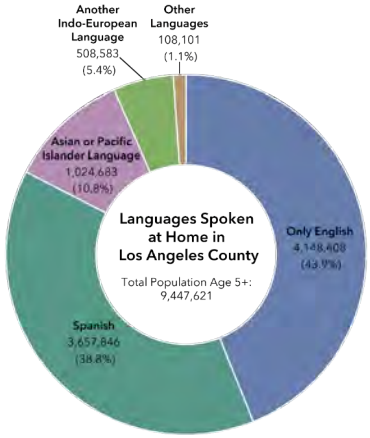


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

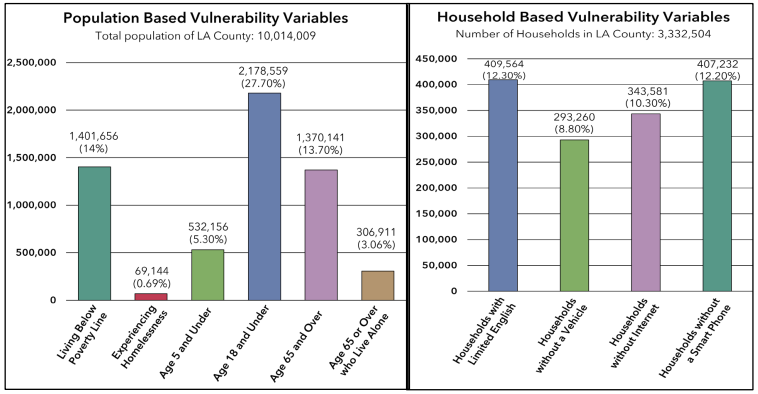


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

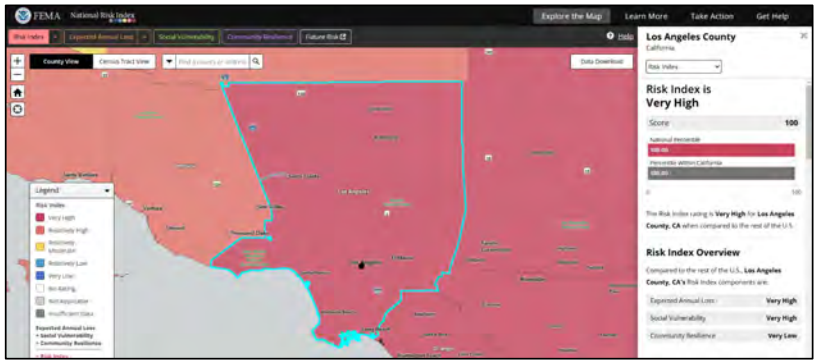


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.

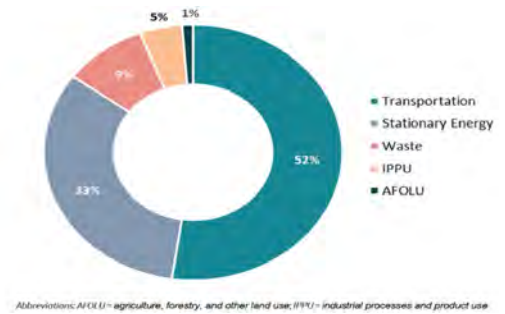


Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
  - Surveys of community needs
  - Consultations with AFN advisory groups
  - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.



- **C-MIST Explanation**
  - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
  - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
  - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
  - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
  - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.



6.2 Wildfire

6.2.1 Nature



Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows—especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD3**: 117.95 sq mi (27.29%)
    - **SD5**: 95.61 sq mi (3.36%)
    - **SD1**: 16.23 sq mi (4.60%)
    - **SD4**: 9.10 sq mi (4.27%)
    - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.



6.3 Earthquake

6.3.1 Nature



Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant. Buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 1,950.78 sq mi (69.50%)
    - **SD3**: 379.41 sq mi (87.99%)
    - **SD1**: 349.17 sq mi (98.95%)
    - **SD2**: 362.95 sq mi (99.99%)
    - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.



6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.



6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	**Figure 6.4.1 Risk of Heat-Related Impacts**
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

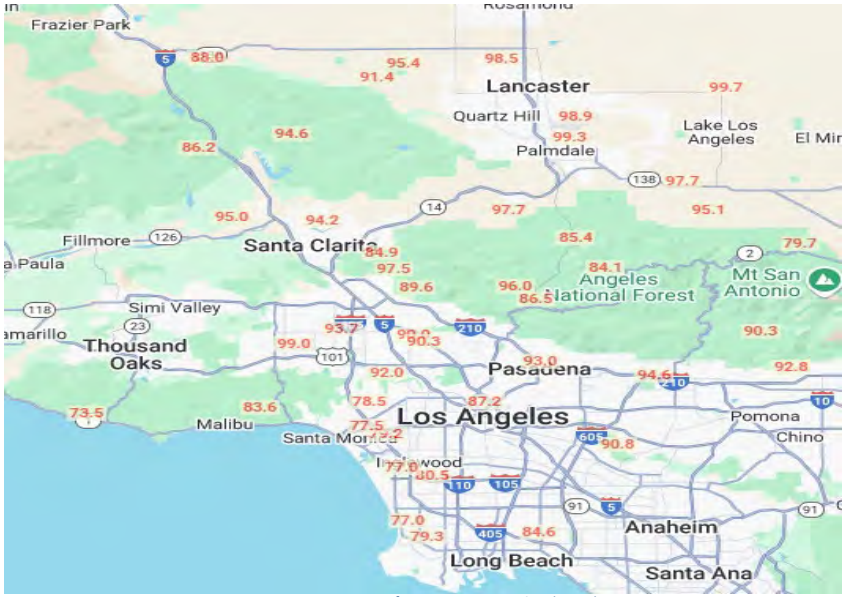


Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.



Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.



6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.



There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

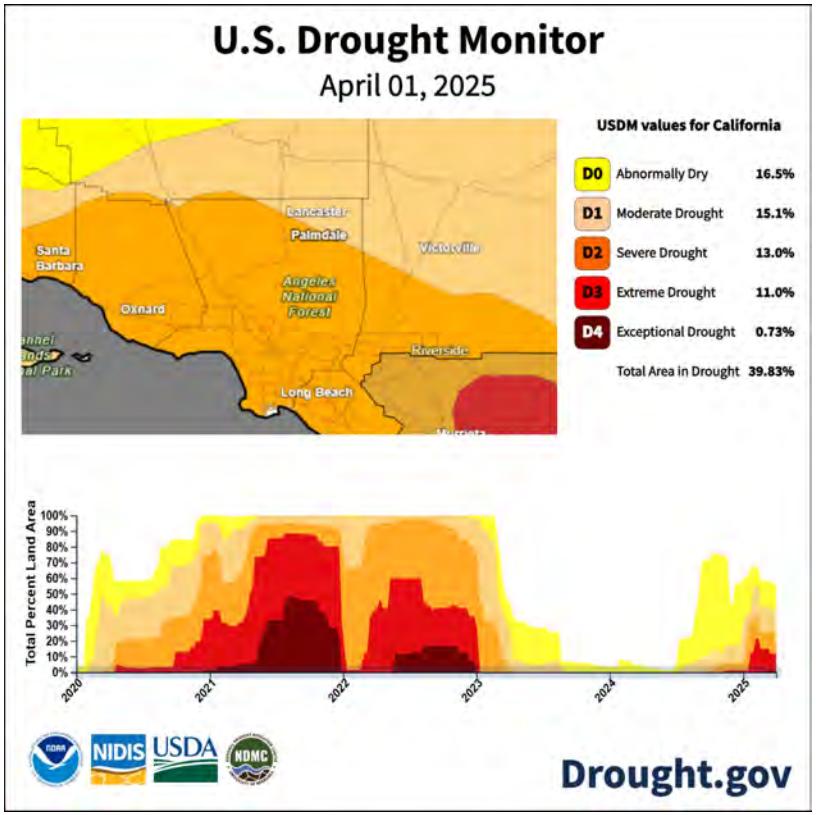


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

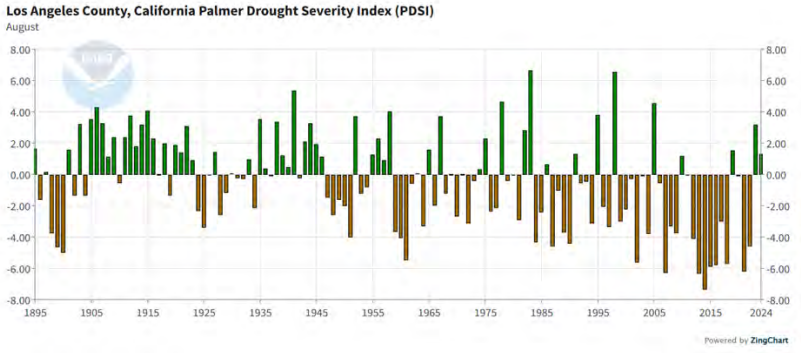


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.



6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.



Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.



6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 223.88 sq mi (7.97%)
    - **SD1**: 162.25 sq mi (45.98%)
    - **SD2**: 66.57 sq mi (18.32%)
    - **SD3**: 25.76 sq mi (5.97%)
    - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
    - Fire Department: 112 (33.22%)
    - Public Works: 92 (40.00%)
    - Health Services: 29 (44.62%)
    - Public Health: 17 (42.50%)
    - Libraries: 30 (34.48%)
    - Parks: 65 (35.50%)
    - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness–making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.



6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.



Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

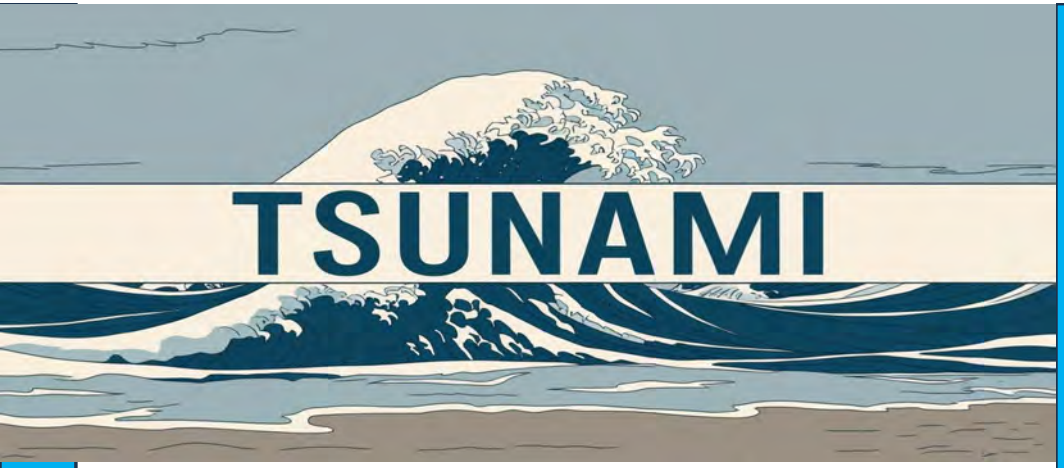
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

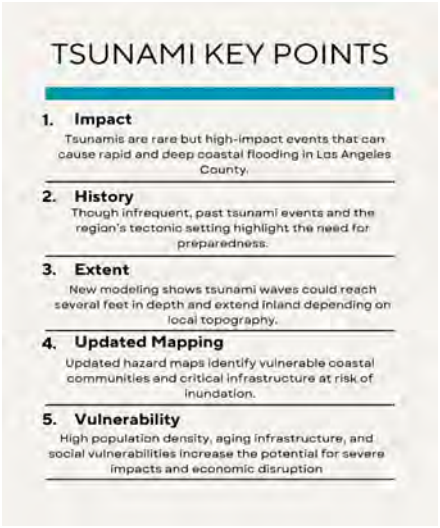
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map—developed using enhanced modeling techniques and updated coastal geomorphology data—highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.



6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.



Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023** (**DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

6.10.9 Summary

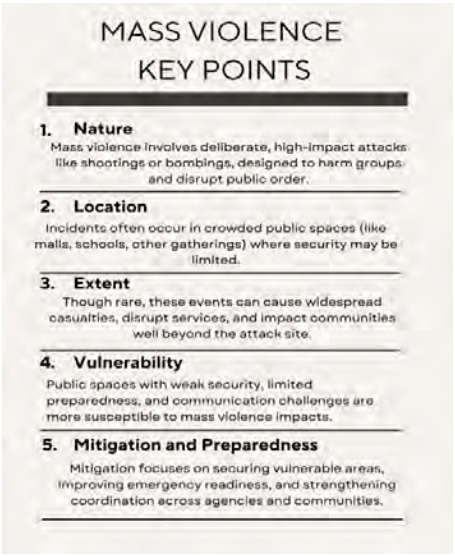
Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.



6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.



- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.



6.12 Cybersecurity Incidents

6.12.1 Nature



Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:

- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents—both in terms of economic impact and service disruption—highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.



6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

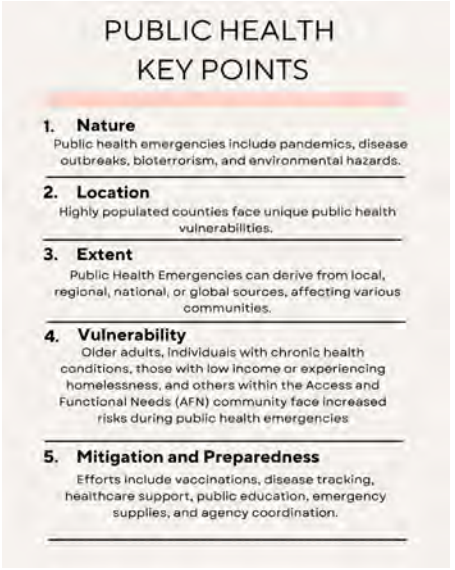
- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.



6.14 Public Health Emergencies

6.14.1 Nature



Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

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7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* **Land Movement** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.	*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**
Source: Los Angeles County Department of Public Works	
Type: Structural and Infrastructure Projects	
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.	*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**
Source: Los Angeles County Department of Public Works, among others.	
Type: Natural Systems Protections	
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.	*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.	*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works	
Type: Education and Awareness Programs	
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.	*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.	*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		*S****evere Wind/Tornado***				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	**Earthquake** **Dam Failure**	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	**Drought**	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	**Drought**	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	**Extreme Heat**	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	**Flooding** **Tsunami**	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	**Mass Violence** **Cyber Incidents**	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	**Mass Violence** **Cyber Incidents**	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	**Mass Violence**	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	**Extreme Heat**	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	**Public Health Emergencies**	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	**Wildfire** **Mass Violence**	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the

incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices

APPENDIX F

WATER RATES

City of Glendora

Water Rates for Calendar Year 2026

Your Water System

The City of Glendora owns and operates a potable water system which includes 210 miles of water mains, 29 reservoirs, 20 pump stations, 8 active wells, and 13,500 water meters. The City serves an area of approximately 11 square miles and provides water service to a population of about 45,550. The water system consists of 17 pressure zones, which is categorized into 4 main zone classes, as illustrated in the following table.

Zone Class	Hydraulic Zones
A	1, 1RB, 1RA
B	2, 1A, 1B
C	3, 1BH1, 2H1, 2H2
D	3A, 3B, 3C, 3C1, 3D, 4, 4A

The City provides reliable water service 24 hours a day, 7 days a week. To ensure continuous high-quality service, Glendora has developed a water rate structure that is fair, equitable, and promotes water conservation in compliance with State mandates. The primary source of water supply is local groundwater from the Main San Gabriel Groundwater Basin (Main Basin). The water supply is supplemented with imported water from Three Valleys Municipal Water District through three (3) connections.

In April 2023, the Water Master Plan was finalized by AKM Consulting Engineers. The document is a comprehensive planning guide for the improvement and upgrade of the water system. Some of the wells and pipes are over 100 years old, and there are many facilities that have reached the end of their useful lives. The Water Master Plan recommended a Capital Improvement Plan (CIP) to improve wells, reservoirs, and pump stations based upon asset condition assessments and operational needs. With an average of 265 pipe breaks per year, the Water Master Plan developed pipe improvement projects by conducting a risk-based pipe condition assessment.

Additionally, projects were recommended to ensure that the system is capable of providing adequate supply, storage, pressure, and water flow for normal system operations and standard fire flow events. The Water Master Plan identified $350M in needed upgrades, with budgeted CIP totals of $30M budgeted for the first five (5) years.

Rate Structure

The water rate structure was developed to ensure that there is sufficient revenue to fund the safe and reliable delivery of water to customers, the completion of infrastructure projects over the next five (5) years and maintain an emergency reserve fund.

In compliance with Proposition 218, the City Council approved a water rate structure on November 28, 2023. The rate structure implemented in January 2024, consists of a fixed meter connection charge, tiered consumption rates, and elevation charges for pumping expenses in hydraulic zones at higher elevations. In subsequent calendar years, the water rates are adjusted by the Consumer Price Index for all urban consumers (CPI-U) for Los Angeles-Long Beach-Anaheim published by the U.S. Department of Labor. The CPI-U adjustment is based on the percentage change between October of the prior year and October of the current year, not to exceed a total increase of five percent (5%) for each year.

The Rate Schedule for 2026 reflects the 3.45%* increase in the CPI-U for Los Angeles-Long Beach-Anaheim from October 2024 to October 2025. (**Due to the federal government shutdown, the October 2025 CPI-U is not available. The average of the CPI-U from September and November 2025 was used to estimate the October 2025 value and calculate the new rates.)*

Bi-Monthly Fixed Meter Connection Charges

The Meter Connection Charge is a fixed fee that varies according to the customer's water meter size. The bi-monthly fixed charge components increase as the meter size increases due to the affect that a large meter has on the overall water system infrastructure. The revenue generated for the meter connection charge was developed to fund fixed expenditures, which include existing debt service, future debt service (covering 50% of the capital improvement projects), and 50% of the operation and maintenance related expenditures (tools, equipment, meters, pipes, salaries, benefits, customer service, etc.).

Consumption Rates

Consumption Rates include components for four (4) consumption Tiered Rates and Elevation Rates. The revenue generated will fund the expenditures for groundwater, purchased water, the production of water, water conservation programming, and 50% of the capital improvement projects. The allowable usage in each tier is takes into consideration the California Assembly Bill 1668 indoor water use goal, minimum usage by meter size, and the existing rate structure's Baseline Allocation Threshold Units.

The Elevation Rate component is broken up by four (4) zone classes, which were established as part of this study to assign the costs fairly and equitably. The revenue generated will fund the energy and pumping facilities expenditures that are required to pump water to the higher zone elevations and 50% of the operation and maintenance expenditures (tools, equipment, pumps, pipes, salaries, benefits, customer service, etc.).

Your water rates pay for:

- Groundwater and imported water supply
- 24/7 Operations
- Routine maintenance and emergency repairs
- Strategic waterline upgrades and replacement
- Supply reliability, via Main San Gabriel Watermaster
- Community programs
- Conservation programs

City of Glendora

Water Rates for Calendar Year 2026

Consumption Threshold (CCF)*				
Meter Size (inches)	Tier 1	Tier 2	Tier 3	Tier 4
5/8 & 3/4	1-12	13-38	39-76	77+
1	1-18	19-67	68-134	135+
1 ½	1-42	43-134	135-268	269+
2	1-64	65-220	221-440	441+
3	1-181	182-419	420-838	839+
4	1-181	182-658	659-1,316	1,317+
6 & 8	1-328	329-2,341	2,342-4,682	4,683+

*Billing Units are measured in hundred cubic feet, CCF or HCF. (1 CCF = 748 gallons)

Bi-Monthly Meter Connection Charge	
Meter Size (inches)	Meter Connection Charge
5/8 & 3/4	$90.96
1	$143.01
1 ½	$273.89
2	$440.74
3	$1,048.71
4	$1,048.71
6	$2,301.98
8	$2,301.98

Consumption Rates					
Zone	Tier 1	Tier 2	Tier 3	Tier 4	Elevation
A	$1.86	$2.86	$3.85	$4.84	$0.24
B	$1.86	$2.86	$3.85	$4.84	$1.09
C	$1.86	$2.86	$3.85	$4.84	$2.19
D	$1.86	$2.86	$3.85	$4.84	$3.63

Example: A typical residential customer with a ¾” meter using 38 billing units will see an average increase of $6.73 per billing period.

FOR QUESTIONS, CONCERNS, OR MORE INFORMATION:

Water Billing:

Phone: (626) 914-8239

Email: wbilling@cityofglendora.gov

Website: cityofglendora.gov/waterbilling

Conservation:

Phone: (626) 852-5205

Email: waterconservation@cityofglendora.gov

Website: cityofglendora.gov/waterconservation

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

C

2025 RUWMP Part 4

City of La Verne

Appendix C

C1: UWMP Compliance Checklist

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Part 2 Chapter 3 Part 1 Chapter 3
x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Part 2 Chapter 3 Executive Summary
x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Part 2 Chapter 3
x	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Part 2 Chapter 3 Section 2.1
x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Part 2 Chapter 3
x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Part 2 Chapter 3
x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Part 2 Chapter 3 Section 9 Part 4 Appendix C-2
x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Part 4 Appendix C-2
x	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Part 1 Chapter 5
n/a	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	n/a
x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Part 2 Chapter 3 Section 1.1
x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Part 2 Chapter 3 Section 1.1
x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Part 2 Chapter 3 Section 1.1
x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Part 2 Chapter 3 Section 1.1
x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Part 2 Chapter 3 Section 1.1
x	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Part 2 Chapter 3 Section 2
x	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Part 2 Chapter 3 Section 2.1.3
x	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Part 2 Chapter 3 Section 2.1.3
x	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Part 2 Chapter 3 Section 2.3
x	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Part 2 Chapter 3 Section 2.2

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Part 2 Chapter 3 Section 2.2
x	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Part 2 Chapter 3 Section 2
x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Part 2 Chapter 3 Section 2.4 Part 1 Chapter 5
n/a	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	n/a
x	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Part 2 Chapter 3 Section 3
x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Part 2 Chapter 3 Section 4 Part 1 Chapter 3
x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Part 2 Chapter 3 Section 4 Part 2 Chapter 3 Section 5.3 Part 1 Chapter 5 Section 2
x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Part 2 Chapter 3 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Part 2 Chapter 3 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Part 2 Chapter 3 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Part 2 Chapter 3 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Part 2 Chapter 3 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Part 2 Chapter 3 Section 4.2 Part 1 Chapter 3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Part 2 Chapter 3 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Part 2 Chapter 3 Section 4.8
x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Part 2 Chapter 3 Section 4.8 Part 1 Chapter 3 Part 1 Chapter 5
x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Part 2 Chapter 3 Section 4.6
x	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Part 2 Chapter 3 Section 4.5
x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Part 2 Chapter 3 Section 4.5
x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Part 2 Chapter 3 Section 4.5.1
x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Part 2 Chapter 3 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Part 2 Chapter 3 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Part 1 Chapter Section 5
x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Part 1 Chapter 3 Section 8
x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Part 2 Chapter 1 Section 4.7 Part 1 Chapter 3 Section 9
x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Part 2 Chapter 3 Section 4.9 Part 4 Appendix C
x	7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Part 2 Chapter 3 Section 5 Part 1 Chapter 3
x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Part 2 Chapter 3 Section 5.3 Part 1 Chapter 5 Section 2
x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Part 1 Chapter 3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Part 2 Chapter 3 Section 2.4 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Part 2 Chapter 3 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Part 2 Chapter 3 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Part 2 Chapter 3 Section 5.1 Part 1 Chapter 5
x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Part 4 Appendix C-7
x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Part 4 Appendix C-7
x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Part 4 Appendix C-7
x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Part 4 Appendix C-7
x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Part 4 Appendix C-7
x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Part 4 Appendix C-7
x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Part 4 Appendix C-7
x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix C-7

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies*.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought*.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Part 4 Appendix C-7
x	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Part 2 Chapter 3 Section 8
n/a	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	n/a
x	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9
x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Part 2 Chapter 3 Section 9 Part 4 Appendix C-2
x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9
x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix C-3
x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Part 4 Appendix C-3
x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix C-3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9
x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9
x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9
x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9
x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9
x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9
x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 3 Section 9

C2: Public Outreach

C2: Attachment 1 – 60 Day Notices

Document will be provided upon request through our contact us page.

C2: Attachment 2 – Regional Workshop 1# Materials

Document will be provided upon request through our contact us page.

C2: Attachment 3 – Regional Workshop #2 Materials

Document will be provided upon request through our contact us page.

C3: Adoption Resolution

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RESOLUTION NO. 26-34

A RESOLUTION OF THE CITY COUNCIL, CITY OF LA VERNE, CALIFORNIA, APPROVING THE CITY OF LA VERNE'S 2025 URBAN WATER MANAGEMENT PLAN; PART 1, PART 2 CHAPTER 3, PART 3, AND PART 4 APPENDIX C

WHEREAS, Article 3 of the California Urban Water Management Planning Act (Act) "requires every urban water supplier to prepare and adopt" an Urban Water Management Plan (UWMP);

WHEREAS, the City Council desires to comply with the Act, which requires an update of the plan once every five (5) years;

WHEREAS, prior to approving its UWMP, the City must conduct a public hearing notice in accordance with California Government Code Section 6066;

WHEREAS, on March 18, 2026, a notice was sent to cities, the county, and water agencies that utilize La Verne water that the 2025 UWMP update was being prepared; and a Public Hearing for the 2025 UWMP was scheduled for May 18, 2026;

WHEREAS, a copy of the draft 2025 UWMP update was placed on file in the City Clerk's Office for public review;

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of La Verne as follows:

Section 1. The City Council hereby accepts and approves Part 1, Part 2 Chapter 3, Part 3 and Part 4 Appendix C within the attached UWMP (Exhibit A)

Section 2. The City Manager, or designee, is hereby authorized and directed, upon adoption of this resolution, to submit a copy of this resolution and the City's approved 2025 UWMP to the California Department of Water Resources (DWR).

Section 3. The Mayor shall sign and the Deputy City Clerk shall certify to the passage and adoption of this Resolution and thereupon the same shall take effect and be in force.

PASSED, APPROVED AND ADOPTED this 18th day of May, 2026.

Signed by:
BEA6F4E47931470...

Mayor Tim Hepburn

ATTEST:

Signed by:
Debra Fritz, La Verne Deputy City Clerk
585DCD6BE8844CF...

Debra Fritz, CMC Deputy City Clerk

Docusign Envelope ID: DAB3F49A-9E7A-8511-807E-ABA5852F2525

CERTIFICATION

I hereby certify that the foregoing **Resolution No. 26-34** was duly and regularly adopted by the City Council of the City of La Verne at a meeting thereof held on the 18th **day of May, 2026,** by the following vote:

AYES:	Crosby, Johnson, Lau and Kashifalghita
NOES:	None
ABSENT:	Hepburn
ABSTAIN:	None

Signed by:
Debra Fritz, La Verne Deputy City Clerk
585DCD6BE8844CF...

Debra Fritz, CMC Deputy City Clerk

C4: Ordinances

The following ordinance is available online. Select the link below to view Ordinance No. 1076 (Pages 25-32).

C5: DWR Tables

Submittal Table 2-1 Retail: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
CA1910062	La Verne Water System	8,833	6,698
	Total	**8,833**	**6,698**

Submittal Table 2-2: Plan Identification

Type of Plan	Name of Regional Alliance or RUWMP
Individual UWMP	Three Valleys Regional Urban Water Management Plan

Submittal Table 2-3: Supplier Identification

Type of Supplier	Year Type	Month and date that the year begins (mm/dd)	Units of measure used in UWMP
Supplier is a retail supplier	Fiscal Year	07/01	AF

Submittal Table 2-4 Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use.
Wholesale Water Supplier Name
Three Valleys Municipal Water District

Submittal Table 3-1 Retail: Population - Current and Projected

Category	2025	2030	2035	2040	2045	2050*(opt)*
Population Served	30,807	30,971	31,135	31,189	31,243	31,298

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual

Use Type	Additional Description (as needed)	2025 Actual Water Use Potable or Non-Potable	2025 Actual Water Use Volume (AF)
Single Family		Potable	3,458
Multi-Family		Potable	1,074
Commercial		Potable	575
Industrial		Potable	145
Institutional/Governmental		Potable	1,205
Agricultural		Potable	18
Other (optional)		Potable	22
Distribution System Water Loss		Potable	201
		Subtotal Potable	6,698
		Subtotal Non-Potable	0
		Total	**6,698**

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected

Use Type	Additional Description	Projected Water Use Potable or Non-Potable (Optional)	Projected Water Use 2030 (AF)	Projected Water Use 2035 (AF)	Projected Water Use 2040 (AF)	Projected Water Use 2045 (AF)	Projected Water Use 2050 opt (AF)
Single Family		Potable	3,189	3,182	3,163	3,144	3,126
Multi-Family		Potable	988	986	980	974	968
Commercial		Potable	531	530	526	523	520
Industrial		Potable	138	138	137	136	135
Institutional		Potable	1,098	1,096	1,090	1,083	1,077
Agricultural		Potable	17	17	17	17	17
Other		Potable	17	17	17	17	17
Distribution System Water Losses		Potable	374	374	371	369	367
		Subtotal Potable	6,352	6,340	6,301	6,263	6,228
		Subtotal Non-Potable	0	0	0	0	0
		Total	**6,352**	**6,340**	**6,301**	**6,263**	**6,228**

Submittal Table 4-3 Retail: Inclusion in Water Use Projections

Projection Item	Included in Projections?
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included In Projections?	Yes

Submittal Table 4-5 Retail: Water Loss Audit Reporting

Public Water System ID #	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910062	2020	Yes
CA1910062	2021	Yes
CA1910062	2022	Yes
CA1910062	2023	Yes
CA1910062	2024	Yes
CA1910062	2025	Yes

Notes: Report submittal status for all five years for each Public Water System as available. The "Volume of Water Loss" quantities for FY 2019-20 through FY 2024-25 were obtained from the annual AWWA Water Loss Audits (and based on the combination of apparent losses and real losses). The AWWA Water Loss Audits were reported on a fiscal year basis.

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard

Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System?	Real Water Loss State Water Board Standard 2028 Real Water Loss Standard per Unit per day	Real Water Loss State Water Board Standard Units for Real Water Loss	Real Water Loss Most Recent AWWA Water Loss Audit Number of Units (Connections or Miles corresponding with units selected)	Real Water Loss Most Recent AWWA Water Loss Audit Volume of Total Real Loss (AF) (from AWWA Water Loss Audit)	Real Water Loss Per Unit per Day	Apparent Water Loss State Water Board Standard 2028 Apparent Water Loss Standard per Unit per Day	Apparent Water Loss State Water Board Standard Units for Apparent Water Loss	Apparent Water Loss Most Recent AWWA Water Loss Audit Number of Connections	Apparent Water Loss Most Recent AWWA Water Loss Audit Volume of Total Apparent Loss (AF) (from AWWA Water Loss Audit)	Apparent Water Loss Per Unit per Day
CA1910062	Yes	19.9	Gallons per Service Connection per Day (GPSCD)	8,618	331	30.3	10.1	Gallons per Service Connection per Day (GPSCD)	8,618	38	4.0

Water Board's Calculated Water Loss Standards

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress

Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target?	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Actual 2025 GPCD (From SB X7-7 Compliance Form) *	Did Supplier meet the 2020 Target in 2025? *
n/a	n/a	211	207	Yes	197	Yes

Notes: n/a=Not Applicable

***** Only for suppliers that did not meet the Target in 2020

Submittal Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type	Potable or Non-Potable (OPTIONAL)	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Alluvial Basin	Potable	Ganesha Basin	179	106	77	168	554
Alluvial Basin	Potable	Live Oak Basin	559	564	381	812	964
Alluvial Basin	Potable	Pomona Basin	1,154	1,221	861	763	963
		Total	**1,892**	**1,891**	**1,319**	**1,743**	**2,481**

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area

Wastewater Collection Name of Wastewater Collection Agency	Wastewater Collection Wastewater Volume Metered or Estimated? Optional	Wastewater Collection Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Recipient of Collected Wastewater Name of Wastewater Treatment Plant (WWTP) and Place ID Number	Recipient of Collected Wastewater Is WWTP Located Within UWMP Area?
Sanitation Districts of Los Angeles County	Estimated	1,622	San Jose Creek Water Reclamation Plant, Place ID 260156	No
Sanitation Districts of Los Angeles County	Estimated		Pomona Water Reclamation Plant, Place ID 250700	No
	Total Wastewater Received from UWMP Service Area in 2025:	**1,622**		

Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (Optional)	2025 Volume of Wastewater Received from UWMP Service Area (AF)	Total 2025 Volume of Water Treated (AF)	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Treatment Level	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Volume (AF)	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Treatment Level	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Treatment Level	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Name of other entity
Total		**0**	**0**		**0**		**0**		**0**		**0**		**0**	

Notes: Wastewater was not treated or disposed of within the UWMP service area; therefore, this table was intentionally left blank.

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

Use Type	Potable or Non-Potable (after treatment if treated) (Optional)	Additional Information	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use Volume	Potential Recycled Water Use Narrative page number (Optional)
		Subtotal Potable	0	0	0	0	0	0	0	
		Subtotal Non-Potable	0	0	0	0	0	0	0	
		Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Notes: Recycled water is currently not used and not planned for use within the service area of the supplier; therefore, this table was intentionally left blank.

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual

Use Type	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Total	**0**	**0**

Notes: Recycled water was not used in 2025 nor previously projected for use in 2020; therefore, this table was intentionally left blank.

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
		Total (AF)	**0**
		Unit Conversion to AF	**0**

Notes: The Supplier does not plan to expand recycled water use in the future; therefore, this table was intentionally left blank, and a narrative explanation is provided in Section 4.5.1 of the UWMP.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other suppliers?	If Yes, Supplier Name	Additional Description	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AF)

Notes: There are future water supply projects or programs not compatible with this table; therefore, are described in narrative form in Section 4.7 of the UWMP**.**

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Description	2025 Potable or Non-Potable (after treatment if treated) (Optional)	2025 Actual Volume (AF)	2025 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Six Basins	Potable	2,396	
Purchased or Imported Water	Metropolitan Water District - Three Valleys Municipal Water District	Potable	4,302	
		Subtotal Potable	6,698	0
		Subtotal Non-Potable	0	0
		Total	**6,698**	**0**

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Projected Water Supply 2030 Reasonably Available Volume (AF)	Projected Water Supply 2030 Total Entitlement (AF) (Optional)	Projected Water Supply 2035 Reasonably Available Volume (AF)	Projected Water Supply 2035 Total Entitlement (AF) (Optional)	Projected Water Supply 2040 Reasonably Available Volume (AF)	Projected Water Supply 2040 Total Entitlement (AF) (Optional)	Projected Water Supply 2045 Reasonably Available Volume (AF)	Projected Water Supply 2045 Total Entitlement (AF) (Optional)	Projected Water Supply 2050 Reasonably Available Volume (AF)	Projected Water Supply 2050 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Six Basins	Potable	1,849		1,834		1,803		1,758		1,700	
Purchased or Imported Water	Metropolitan Water District – Three Valleys Municipal Water District	Potable	4,503		4,506		4,498		4,505		4,528	
		Subtotal Potable	6,352	0	6,340	0	6,301	0	6,263	0	6,228	0
		Subtotal Non-Potable	0	0	0	0	0	0	0	0	0	0
		Total	**6,352**	**0**	**6,340**	**0**	**6,301**	**0**	**6,263**	**0**	**6,228**	**0**

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year	Volume Available (AF)	Percent of Average Supply
Average Year	2021-2025	6,722	100%
Single-Dry Year	2021	8,170	122%
Consecutive Dry Years 1st Year	2018	7,532	112%
Consecutive Dry Years 2nd Year	2019	6,981	104%
Consecutive Dry Years 3rd Year	2020	7,251	108%
Consecutive Dry Years 4th Year	2021	8,170	122%
Consecutive Dry Years 5th Year	2022	7,440	111%

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	6,352	6,340	6,301	6,263	6,228
Use totals	6,352	6,340	6,301	6,263	6,228
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	7,720	7,705	7,658	7,612	7,569
Use totals	7,720	7,705	7,658	7,612	7,569
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison

Year	Total Type / Difference	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	7,117	7,104	7,060	7,018	6,978
	Use totals	7,117	7,104	7,060	7,018	6,978
	Difference	**0**	**0**	**0**	**0**	**0**
Second year	Supply totals	6,597	6,584	6,544	6,504	6,468
	Use totals	6,597	6,584	6,544	6,504	6,468
	Difference	**0**	**0**	**0**	**0**	**0**
Third year	Supply totals	6,852	6,839	6,797	6,756	6,718
	Use totals	6,852	6,839	6,797	6,756	6,718
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth year	Supply totals	7,720	7,705	7,658	7,612	7,569
	Use totals	7,720	7,705	7,658	7,612	7,569
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth year	Supply totals	7,030	7,017	6,974	6,932	6,893
	Use totals	7,030	7,017	6,974	6,932	6,893
	Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment

Totals	2026	2027	2028	2029	2030
Total Water Use (AF)	7,117	6,597	6,852	7,720	7,030
Total Supplies (AF)	7,117	6,597	6,852	7,720	7,030
Difference w/o WSCP Action (AF)	**0**	**0**	**0**	**0**	**0**

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		

Notes: The Supplier uses the standard six levels of water shortage; therefore, supplier-specific shortage levels and percentage ranges are not separately identified in this table.

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (Percentage)	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)
1	Other Actions (describe)		Not applicable (see NOTES)	Refer to notes below
2	Other Actions (describe)		Not applicable (see NOTES)	Refer to notes below
3	Other Actions (describe)		Not applicable (see NOTES)	Refer to notes below
4	Other Actions (describe)		Not applicable (see NOTES)	Refer to notes below
5	Other Actions (describe)		Not applicable (see NOTES)	Refer to notes below
6	Other Actions (describe)		Not applicable (see NOTES)	Additional imported water can be provided by Metropolitan Water District through Three Valleys Municipal Water District

Notes: Conduct ADU study is a future water supply project and is detailed in section 4.7 of the 2025 UWMP. The three projects listed on in the table above are part of the City of La Verne's 10-year CIP list and for that reason, the planned implementation year for those projects is projected to be by 2040. Planning efforts for the wells could start by 2030 and become operational by 2040.

Submittal Table 8-3 Retail: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Other – Prohibit use of potable water for washing hard surfaces	Percentage	5	Hose washing of sidewalks, walkways, driveways, parking areas, hardscapes, or other paved surfaces shall be prohibited	Yes
1	Other – Prohibit vehicle washing except at facilities using recycled or recirculating water	Percentage	5	Washing of motor vehicles, trailers, boats, and other mobile equipment shall be done only with a hand-held container or hose with a positive shut-off nozzle; allowed at commercial car washes or with reclaimed water	Yes
1	Water Features – Restrict decorative water features	Percentage	5	No water shall be used to clean, fill, or maintain decorative fountains or similar aesthetic structures unless part of a recycling system	Yes
1	Landscape – Restrict runoff from landscape irrigation	Percentage	5	Runoff from landscaped areas into streets, sidewalks, or paved areas is prohibited; watering within 48 hours after measurable precipitation is prohibited	Yes
1	Landscape – Prohibit certain types of landscape irrigation	Percentage	5	Irrigating ornamental turf on public street medians shall be prohibited	Yes
1	CII – Restaurants serve water only upon request	Percentage	5	Restaurants, hotels, cafés, and cafeterias shall not serve drinking water unless expressly requested	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Other – Timely repair of leaks, breaks, and malfunctions	Percentage	5	All indoor and outdoor plumbing leaks must be repaired within 48 hours of discovery or notification	Yes
1	Other – Construction water restrictions	Percentage	5	Construction water for grading and other purposes shall be limited to ground-produced water at the City's discretion	Yes
1	CII – Other commercial/industrial restriction	Percentage	5	Installation of single-pass cooling systems shall be prohibited in buildings requesting new water service	Yes
1	Landscape – Limit irrigation to specific times	Percentage	5	Landscape watering permitted only between one hour before sunset and 10 a.m.; exemptions for nurseries, golf courses, and reclaimed water; drip irrigation and handheld buckets allowed anytime	Yes
2	Landscape – Limit irrigation to specific times	Percentage	15	Watering limited to specific times, max 5 minutes per station, not exceeding 20 minutes per week; reclaimed water exempt	Yes
3	Landscape – Limit irrigation to specific times	Percentage	25	Same restrictions as Level 2 with increased reduction	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
4	Landscape – Prohibit most outdoor irrigation	Percentage	30	All outdoor irrigation prohibited except handheld watering or drip irrigation for mature trees/shrubs; turf irrigation prohibited except golf greens	Yes
5	Landscape – Prohibit most outdoor irrigation	Percentage	40	Same as Level 4 with higher reduction requirement	Yes
1	Other – Prohibit non-recirculating systems	Percentage	5	Installation of non-recirculating water systems prohibited in new commercial conveyor car washes and commercial laundry systems	Yes
1	Other – Prohibit non-water-conserving dish spray valves	Percentage	5	Food preparation establishments shall not use non-water-conserving dishwash spray valves	Yes
3	Other – Swimming pool and spa restrictions	Percentage	30	New swimming pool and spa permits issued at discretion of Public Works Director based on water availability	Yes
4	Other – Swimming pool and spa restrictions	Percentage	30	New swimming pool and spa permits restricted	Yes
4	Other – New water service connection restrictions	Percentage	30	No new water service connections, no upsizing of services, and no net increase in plumbing fixtures	Yes
1	Rebates – Plumbing fixtures and devices	Percentage	5	Rebates provided through MWD and TVMWD	No

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Rebates – Landscape irrigation efficiency		5	Rebates provided through MWD and TVMWD	No

NOTES: All demand reduction actions listed as "Shortage Level 1" are permanent water conservation requirements to La Verne's customers under all of the state standard levels as listed in the Water Shortage Contingency Plan with the exception of Landscape - Limit landscape irrigation to specific times - Watering of landscape or other turf area shall only be permitted between the hours of one hour before sunset and ten a.m., except that this provision shall not apply to commercial nurseries, golf courses, and other water dependent industries; except that there shall be no restriction on watering with reclaimed water, providing that signs are posted that identify reclaimed water is being used. The use of properly operating drip irrigation systems or handheld buckets shall be permitted at any time.

Submittal Table 10-1 Retail: Notification to Cities and Counties

City or County Name	60 Day Notice	Notice of Public Hearing
Claremont	Yes	Yes
Pomona	Yes	Yes
San Dimas	Yes	Yes
Industry	Yes	Yes
Los Angeles County	Yes	Yes

C6: AWWA Water Audits

The following AWWA Water Audit reports are available online. Select the links below to view each report:

- 2020 AWWA Water Audit
- 2021 AWWA Water Audit
- 2022 AWWA Water Audit
- 2023 AWWA Water Audit
- 2024 AWWA Water Audit
- 2025 AWWA Water Audit

If a link is not available, AWWA Water Audit reports for all years can be downloaded from the WUEdata website.

C7: Water Shortage Contingency Plan

C7: Attachment 1 – Water Shortage Contingency Plan Adoption Resolution

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RESOLUTION NO. 26-35

A RESOLUTION OF THE CITY COUNCIL, CITY OF LA VERNE, CALIFORNIA, APPROVING THE CITY OF LA VERNE'S 2025 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, Article 3 of the California Urban Water Management Planning Act (Act) "requires every urban water supplier to prepare and adopt" an Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP)

WHEREAS, compliance with the Act, which requires an update of the plan once every five (5) years;

WHEREAS, prior to approving its WSCP, the City must conduct a public hearing notice in accordance with California Government Code Section 6066;

WHEREAS, on March 18, 2026, a notice was sent to cities, the county, and water agencies that utilize La Verne water that the 2025 UWMP/WSCP was updated where needed; and a Public Hearing for the 2025 UWMP was scheduled for May 18, 2026;

WHEREAS, a copy of the draft 2025 UWMP and WSCP update was placed on file in the City Clerk's Office for public review;

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of La Verne as follows:

Section 1. The City Council hereby accepts and approves the attached 2025 Water Shortage Contingency Plan (Exhibit A)

Section 2. The City Manager, or designee, is hereby authorized and directed, upon adoption of this resolution, to submit a copy of this resolution and the City's approved 2025 WSCP to the California Department of Water Resources (DWR).

Section 3. The Mayor shall sign and the Deputy City Clerk shall certify to the passage and adoption of this Resolution and thereupon the same shall take effect and be in force.

PASSED, APPROVED AND ADOPTED this 18th day of May, 2026.

Signed by:
Tim Hepburn
BEA6E4E47931470...
Mayor Tim Hepburn

ATTEST:
Signed by:
Debra Fritz, La Verne Deputy City Clerk
585DCD6BE8844CF...
Debra Fritz, CMC Deputy City Clerk

Docusign Envelope ID: 665B529C-02EC-8402-81DC-D75D40F38143

CERTIFICATION

I hereby certify that the foregoing **Resolution No.26-35** was duly and regularly adopted by the City Council of the City of La Verne at a meeting thereof held on the **18th day of May, 2026,** by the following vote:

AYES:	Crosby, Johnson, Lau and Kashifalghita
NOES:	None
ABSENT:	Hepburn
ABSTAIN:	None

Signed by:
Debra Fritz, La Verne Deputy City Clerk
585DCD6BE8844CF...

Debra Fritz, CMC Deputy City Clerk

C7: Attachment 2 – Water Shortage Contingency Plan

2025 WATER SHORTAGE CONTINGENCY PLAN

CITY OF LA VERNE

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AFY	Acre-Feet per Year
AMI	Advanced Metering Infrastructure
City	City of La Verne
CWC	California Water Code
DWR	California Department of Water Resources
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
MWD	Metropolitan Water District of Southern California
OSY	Operating Safe Yield
RRA	Risk and Resilience Assessment
SCADA	Supervisory Control and Data Acquisition
TVMWD	Three Valleys Municipal Water District
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan

Water Shortage Contingency Plan

1 Water Supply Reliability Analysis

§10632 (a) (1) The analysis of water supply reliability conducted pursuant to Section 10635.

The City of La Verne's (City) sources of supply were discussed in Chapter 4 of the 2025 Urban Water Management Plan (UWMP) and consist of imported surface water purchased from the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD) and groundwater pumped from the Six Basins. The Six Basins is adjudicated, and groundwater supplies are managed. The reliability of the various sources of supply are discussed in Chapter 5 of the 2025 UWMP.

Limits on the water consumed by any customer of the La Verne water utility may be restricted by the city council. The effective limits of such rationing shall be determined by resolution of the city council adopting the appropriate phase as set out in subsections A through H of this section as the city council deems necessary to meet the conservation requirements imposed on the City by the state of California, MWD or TVMWD. All limits are based upon water use for a two-month period (bimonthly billing period).

2 Annual Water Supply and Demand Assessment Procedures

§10632 (a) (2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

> *§10632.1 An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.*

Since July 1, 2022, the City has submitted an "Annual Water Supply and Demand Assessment" (Annual Assessment) through 2025 as required by the California Department of Water Resources (DWR). This Annual Assessment includes the current year unconstrained demand.

2.1 Decision-Making Process

This section provides the decision-making process that the City will use each year to determine and report to the state, its water supply reliability.

1. City determines supply available based on the Operating Safe Yield (OSY), well production availability and imported water supply availability from TVMWD.
2. City determines infrastructure constraints (including water quality conditions limiting local sources).
3. City determines expected demand.
4. City compares supply and demand and determines water supply reliability for the current year and one dry year.
5. City prepares and submits Annual Assessment Report to the state.
6. City compares total demand to total supply to identify potential shortages. If shortages are identified, the City will determine the necessary WSCP level and corresponding reduction.

2.2 Data and Methodologies

A description of key data inputs and Annual Assessment methodologies used to evaluate the water service reliability for the current year and one dry year. The characteristic of a dry year is at the discretion of the supplier, but it should be adequately defined and ideally align with one of the Water Shortage Contingency Plan (WSCP) water shortage levels.

Evaluation Criteria:
The City relies on its staff members to evaluate water supply, demands, and water shortage levels. The City evaluates changes in groundwater availability and recent water demand trends to determine any deviations from its Annual Assessment.

Water Supply
The City is entitled to a 50% share of the available flow from the Miramar Water Treatment Plant, operated by TVMWD (15 cubic feet per second or 10,865 acre-feet per year (AFY)) plus 25 AFY to meet demands utilizing TVMWD.

The volume projected to be extracted from the Pomona Basin represents maximization of the City's adjudicated rights in the Four Basins of 7.601% of the OSY of the 19,300 AFY.

The safe yields for the Ganesha and Live Oak Basins are currently unknown. As the City continues to develop these basins for groundwater production, it is anticipated that a greater understanding of the respective safe yields will emerge. Considering this, the maximum historical annual production from these basins is assumed to be the safe yield. During the past five years (from FY 2021 to FY 2025) the production volumes were approximately 992 AFY for the Pomona Basin, 217 AFY for the Ganesha Basin, and 656 AFY for the Live Oak Basin.

Current Year Unconstrained Customer Demand

The Annual Assessment uses the City's latest demand forecast, which considers unconstrained customer demands, population growth, weather, and other factors for the current and following years.

Current Year Available Supply

The City evaluates the current year available supply and one dry year available supply in its Annual Assessment, taking into consideration any hydrological and regulatory conditions. The City determines last year's groundwater production and potential production constraints.

Infrastructure Considerations

The City describes the methodology for identifying existing water supply infrastructure capabilities and potential constraints. The City's water supply infrastructure is well documented such as water treatment plants, pipelines, pump stations and groundwater wells. The City evaluates existing water supply and constraints for the current year and for one dry year. Once all constraints have been evaluated, the City will determine whether the total water supply should be adjusted to account for those constraints.

3 Six Standard Water Shortage Stages

§10632 (a) (3) The analysis of water supply reliability conducted pursuant to Section 10635.

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

The six standard water shortage levels correspond to progressively increasing estimated shortage conditions. A supplier must be able to identify locally appropriate shortage response

actions when one of the six shortage levels occurs. Water shortages may be translated from 2015 water shortage levels to the six standard water shortage levels. Since the 2015 Urban Water Management Plan (UWMP) stages did not contain a shortage for greater than 50%, a direct translation is unable to be carried over. The shortage level changes were made in 2020 and have remained the same for 2025.

Table 1 below shows the existing WSCP levels that were retained and are translated to the City's existing 2025 WSCP mandated levels and shortage response actions.

Table 1 – Corresponding Relationship between 2015 and 2025 Shortage Levels

State Standard Levels		City of La Verne Corresponding Shortage Level		
Shortage Level	Percent Shortage Level	City of La Verne Shortage Phases	Supply Reduction	Water Supply Condition
1	Up to 10%	I	10%	Voluntary
		II	5%	Mandatory
		III	10%	Mandatory
2	Up to 20%	IV	15%	Mandatory
		V	20%	Mandatory
3	Up to 30%	VI	25%	Mandatory
		VII	30%	Mandatory
4	Up to 40%	VIII	40%	Mandatory
5	Up to 50%	IX	50%	Mandatory
6	>50%	NA	>50%	Mandatory

3.1 Stages of Action

The Shortage Response Actions are broken up into six standard water shortage levels. They are broken down into up to 10%, 20%, 30%, 40%, 50%, shortages, and greater than 50% shortages.

The following tables delineate the thresholds for each stage. A surcharge shall be levied for exceeding the established baseline allowance. Surcharge shall be established by the City Council for each stage indicated above, as needed. For purposes of establishing the various levels, the base year is defined as "the average amount of water delivered to each nonresidential customer's property during the corresponding bimonthly billing period during a specified period as established from time to time by resolution of the city council. A baseline for residential customers is set forth in Section 13.15.030" (§13.15.015 of the La Verne Municipal Code) provided that no customer shall be deemed to "reduce their water consumption to an amount less than ten thousand gallons per bimonthly billing period" (§13.15.025 of the La Verne Municipal Code). Section 13.15.020 of the La Verne Municipal Code states penalty surcharges shall be levied for each and every customer who exceeds the baseline.

Shortage Level 1 (State Standard - Up to 10% Shortage)
For water shortages up to 10%, Phases I, II or III may be implemented to meet the severity of the impending shortages.

Phase I- The city council orders that overall water consumption be reduced by 10 percent.

Such conservation shall be considered voluntary.

Phase II - The city council orders that overall water consumption be reduced by five percent. Such conservation shall be mandatory and is subject to the following limits:

Table 2 – Phase II under City of La Verne Ordinance (5% Mandatory Water Reduction)

Category	Level	Descriptions of Level
Single-family Residential	A	0-37,000 gallons
	B	37,001-47,000 gallons
	C	47,001-67,000 gallons
	D	67,001-97,000 gallons
	E	97,001 gallons or greater
Multi-family Residential	A	≤95% of base year
	B	>95% of base year and <100% of base year
	C	≥100% of base year
Irrigation and Other Accounts	A	≤90% of base year
	B	>90% of base year and <100% of base year
	C	≥100% of base year
All Remaining Accounts	A	≤95% of base year
	B	>95% of base year and <100% of base year
	C	≥100% of base year

Phase III - The city council orders that overall water consumption be reduced by ten percent. Such conservation shall be mandatory and is subject to the following limits:

Table 3 – Phase III under City of La Verne Ordinance (10% Mandatory Water Reduction)

Category	Level	Description of Level
Single-family Residential	A	0-34,000 gallons
	B	34,001-44,000 gallons
	C	44,001-64,000 gallons
	D	64,001-94,000gallons
	E	94,001 gallons or greater
Multi-family Residential	A	≤90% of base year
	B	>90% of base year and <100% of base year
	C	≥100% of base year
Irrigation and Other Accounts	A	≤80% of base year
	B	>80% of base year and <100% of base year
	C	≥100% of base year
All Remaining Accounts	A	≤90% of base year
	B	>90% of base year and <100% of base year
	C	≥100% of base year

Shortage Level 2 (State Standard - 10%-20% Shortage)

For water shortages up to 20%, Phases IV or V may be implemented to meet the severity of the impending shortages.

Phase IV - The city council orders that overall water consumption be reduced by fifteen

percent. Such conservation shall be mandatory and is subject to the following limits:

Table 4 – Phase IV under City of La Verne Ordinance (15% Mandatory Water Reduction)

Category	Level	Descriptions of Level
Single-family Residential	A	0-31,000 gallons
	B	31,001-41,000 gallons
	C	41,001-61,000 gallons
	D	61,001-91,000 gallons
	E	91,001 gallons or greater
Multi-family Residential	A	≤85% of base year
	B	>85% of base year and <100% of base year
	C	≥100% of base year
Irrigation and Other Accounts	A	≤70% of base year
	B	>70% of base year and <100% of base year
	C	≥100% of base year
All Remaining Accounts	A	≤85% of base year
	B	>85% of base year and <100% of base year
	C	≥100% of base year

Phase V - The city council orders that overall water consumption be reduced by twenty percent. Such conservation shall be mandatory and is subject to the following limits:

Table 5 – Phase V under City of La Verne Ordinance (20% Mandatory Water Reduction)

Category	Level	Descriptions of Level
Single-family Residential	A	0-28,000 gallons
	B	28,001-38,000 gallons
	C	38,001-58,000 gallons
	D	58,001-88,000 gallons
	E	88,001 gallons or greater
Multi-family Residential	A	≤80% of base year
	B	>80% of base year and <100% of base year
	C	≥100% of base year
Irrigation and Other Accounts	A	≤60% of base year
	B	>60% of base year and <100% of base year
	C	≥100% of base year
All Remaining Accounts	A	≤80% of base year
	B	>80% of base year and <100% of base year
	C	≥100% of base year

Shortage Level 3 – (State Standard 20%-30% Shortage)
For water shortages up to 30%, Phases VI or VII may be implemented to meet the severity of the impending shortages.

Phase VI - The city council orders that overall water consumption be reduced by twenty-five percent. Such conservation shall be mandatory and is subject to the following limits:

Table 6 – Phase VI under City of La Verne Ordinance (25% Mandatory Water Reduction)

Category	Level	Descriptions of Level
Single-family Residential	A	0-25,000 gallons
	B	25,001-35,000 gallons
	C	35,001-55,000 gallons
	D	55,001-85,000 gallons
	E	85,001 gallons or greater
Multi-family Residential	A	≤75% of base year
	B	>75% of base year and <100% of base year
	C	≥100% of base year
Irrigation and Other Accounts	A	≤50% of base year
	B	>50% of base year and <100% of base year
	C	≥100% of base year
All Remaining Accounts	A	≤75% of base year
	B	>75% of base year and <100% of base year
	C	≥100% of base year

Phase VII - The city council orders that overall water consumption be reduced by thirty percent. Such conservation shall be mandatory and is subject to the following limits:

Table 7 – Phase VII under City of La Verne Ordinance (30% Mandatory Water Reduction)

Category	Level	Descriptions of Level
Single-family Residential	A	0-22,000 gallons
	B	22,001-32,000 gallons
	C	32,001-52,000 gallons
	D	52,001-82,000 gallons
	E	82,001 gallons or greater
Multi-family Residential	A	≤70% of base year
	B	>70% of base year and <100% of base year
	C	≥100% of base year
Irrigation and Other Accounts	A	≤40% of base year
	B	>40% of base year and <100% of base year
	C	≥100% of base year
All Remaining Accounts	A	≤70% of base year
	B	>70% of base year and <100% of base year
	C	≥100% of base year

Shortage Level 4 - (State Standard 30%-40% Shortage)

For water shortages up to 40%, Phases VIII may be implemented to meet the severity of the impending shortages.

Phase VIII - The city council orders that overall water consumption be reduced by forty percent. Such conservation shall be mandatory and is subject to the following limits:

Table 8 – Phase VIII under City of La Verne Ordinance (40% Mandatory Water Reduction)

Category	Level	Descriptions of Level
Single-family Residential	A	0-18,000 gallons
	B	18,001-28,000 gallons
	C	28,001-48,000 gallons
	D	48,001-78,000 gallons
	E	78,001 gallons or greater
Multi-family Residential	A	≤60% of base year
	B	>60% of base year and <100% of base year
	C	≥100% of base year
Irrigation and Other Accounts	A	≤30% of base year
	B	>30% of base year and <100% of base year
	C	≥100% of base year
All Remaining Accounts	A	≤60% of base year
	B	>60% of base year and <100% of base year
	C	≥100% of base year

Shortage Level 5 - (State Standard 40%-50% Shortage)
For water shortages up to 50%, Phases IX may be implemented to meet the severity of the impending shortages.

Phase IX - The city council orders that overall water consumption be reduced by fifty percent. Such conservation shall be mandatory and is subject to the following limits:

Table 9 – Phase IX under City of La Verne Ordinance (50% Mandatory Water Reduction)

Category	Level	Descriptions of Level
Single-family Residential	A	0-16,000 gallons
	B	16,001-23,000 gallons
	C	23,001-43,000 gallons
	D	43,001-73,000 gallons
	E	73,001 gallons or greater
Multi-family Residential	A	≤50% of base year
	B	>50% of base year and <100% of base year
	C	≥100% of base year
Irrigation and Other Accounts	A	≤25% of base year
	B	>25% of base year and <100% of base year
	C	≥100% of base year
All Remaining Accounts	A	≤50% of base year
	B	>50% of base year and <100% of base year
	C	≥100% of base year

Shortage Level 6 - (State Standard >50% Shortage)
Chapter 13.15 of the La Verne Municipal Code provides the authority for the City Council to adopt increasingly restrictive water use measures, including emergency and urgency ordinances. These actions may include outdoor water use prohibitions, allocation-based penalties, and other mandatory conservation measures sufficient to address water shortages exceeding 50 percent.

4 Shortage Response Actions

§10632 (a) (4) The analysis of water supply reliability conducted pursuant to Section 10635.

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

The Shortage Response Actions are broken up into six standard water shortage levels. They are broken down into up to 10%, 20%, 30%, 40%, 50%, shortages, and greater than 50% shortages.

4.1 Demand Reduction

There are a number of demand reduction measures the City implements as response actions to address shortage levels. Some of these include public education and outreach campaigns, watering, and other outdoor use restrictions. Partnered with TVMWD and MWD, the City distributes items that reduce demand such as efficient toilets, urinals, and a few more water use efficiency actions. Additionally, a landscape training for waterwise gardening is provided by the City, with demand reduction as an outcome.

According to the City Ordinance for water conservation, the following water use restrictions and regulations shall apply to the respective phases of this section as approved by the city council. Compliance with these regulations shall be mandatory.

Phase I. Mandatory Restrictions

1) Hose washing of sidewalks, walkways, driveways, parking areas, hardscapes, or other paved surfaces shall be prohibited.

2) Washing of motor vehicles, trailers, boats, and other types of mobile equipment shall be done only with a hand-held water container or a hose equipped with a positive shut off nozzle for quick rinses, except that washing may be done on the immediate premises of a commercial car wash or with reclaimed water.

3) No water shall be used to clean, fill or maintain levels in decorative fountains, or other similar aesthetic structures unless such water is part of a recycling system.

4) Watering in a manner that causes runoff from landscaped areas into adjoining streets, sidewalks, or other paved areas, or watering within forty-eight hours after measurable precipitation shall be prohibited.

5) Irrigating ornamental turf on public street medians shall be prohibited.

Phase II. Mandatory Restrictions

The restrictions identified in Phase I shall remain in effect.

6) No restaurant, hotel, café, cafeteria, or other public place where food is sold, served, or offered for sale, shall serve drinking water to any customer unless expressly requested.

7) All leaks from indoor and outdoor plumbing fixtures shall be repaired within forty-eight hours of discovery or notification.

8) Construction water for grading and other purposes shall be limited to groundwater, at the discretion of the city.

9) Installation of single pass cooling systems shall be prohibited in buildings requesting new water service.

10) Watering of landscape or other turf area shall only be permitted between the hours of one hour before sunset and ten a.m., except that this provision shall not apply to commercial nurseries, golf courses, and other water dependent industries; except that there shall be no restriction on watering with reclaimed water, providing that signs are posted that identify reclaimed water is being used. The use of properly operating drip irrigation systems or handheld buckets shall be permitted at any time.

11) Installation of non-recirculating water systems shall be prohibited in new commercial conveyor car wash and new commercial laundry systems.

12) Food preparation establishments, such as restaurants or cafes, shall be prohibited from using non-water conserving dish wash spray valves.

Phase III. Mandatory Restrictions

The restrictions identified in Phases I and II shall remain in effect with no further restrictions applying.

Phase IV. Mandatory Restrictions

1) The restrictions identified in Phase I and II, excepting (#10), shall remain in effect.

2) Watering of landscape or other turf area, including that of commercial nurseries, golf courses, and other water dependent industries shall only be permitted between the hours of one hour before sunset and ten a.m. for no more than five minutes per station or area, and not to exceed more than twenty minutes per week; except that there shall be no restriction on watering with reclaimed water, providing that signs are posted that identify reclaimed water is being used. The use of properly operating drip

irrigation systems or handheld buckets shall be permitted at any time.

Phase V. Mandatory Restrictions

1) The restrictions identified in Phase I and II, excepting (#10), shall remain in effect.

2) Watering of landscape or other turf area, including that of commercial nurseries, golf courses, and other water dependent industries shall only be permitted between the hours of one hour before sunset and ten a.m. for no more than five minutes per station or area, and not to exceed more than twenty minutes per week; except that there shall be no restriction on watering with reclaimed water, providing that signs are posted that identify reclaimed water is being used. The use of properly operating drip irrigation systems or handheld buckets shall be permitted at any time.

Phase VI. Mandatory Restrictions

1) The restrictions identified in Phase I and II, excepting (#10), shall remain in effect.

2) Watering of landscape or other turf area, including that of commercial nurseries, golf courses, and other water dependent industries shall only be permitted between the hours of one hour before sunset and ten a.m. for no more than five minutes per station or area, and not to exceed more than twenty minutes per week; except that there shall be no restriction on watering with reclaimed water, providing that signs are posted that identify reclaimed water is being used. The use of properly operating drip irrigation systems or handheld buckets shall be permitted at any time.

Phase VII. Mandatory Restrictions

1) The restrictions identified in Phase I and II, excepting (#10), shall remain in effect.

2) Watering of landscapes and other turf area, including that of commercial nurseries, golf courses, and other water dependent industries shall only be permitted between the hours of one hour before sunset and ten a.m. for no more than five minutes per station or area, and not to exceed more than twenty minutes per week; except that there shall be no restriction on watering with reclaimed water, providing that signs are posted that identify reclaimed water is being used. The use of properly operating drip irrigation systems or handheld buckets shall be permitted at any time.

3) New swimming pool and spa permits shall be issued at the discretion of the public works director based upon the availability of water.

Phase VIII. Mandatory Restrictions

1) The restrictions identified in Phase I and II, excepting (#10), shall remain in effect.

2) All outdoor irrigation is prohibited except for handheld watering or use of properly operating drip irrigation systems to water mature trees and mature shrubs. Commercial nurseries and other water dependent industries shall only water landscape stock by use of properly operating drip irrigation systems or handheld buckets. Watering of all outdoor turf areas is prohibited, excepting golf course greens.

3) Issuance of new swimming pool and spa permits shall be prohibited.

4) No new water service connections will be permitted nor will an increase in the size of an already existing water service connection be permitted, nor will there be any net increase in plumbing fixtures to an already existing water service connection. (Ord. 1009 § 2, 2009; Ord. 834, 1991; Ord. 822 § 3, 1991)

4.2 Supply Augmentation

The City's water system has enough supply for a single dry year and multiple dry years, as shown in Table 4-2 and Table 4-3 of the 2025 Urban Water Management Plan (UWMP). In the event the City needs additional water, the City is currently able to withstand a 3-day shutdown and likely a 7-day shutdown with increased conservation through communication with customers.

The City has access to other supply connections with Golden State Water Company. The City has access to MWD import water through a City owned emergency supply pump station on Moreno St. And Gladstone Ave. The City also maintains a contact list of nearby water bottlers.

4.3 Operational Changes

Under water shortage conditions, the City will implement additional monitoring and tracking of water usage rates for customers. The City is currently in the process of converting to AMI which will provide the ability to closely track water use and locate water loss. In addition, staff will be directed to report misuse of water supply. This aligns with the water shortage condition stages.

In addition, the City has submitted Annual Assessments as required by DWR, which includes a review of the water supplies available to meet water demands for the current and upcoming years. Preparation of the Annual Assessment assists the City in determining any potential operational changes.

4.4 Additional Mandatory Restrictions

The mandatory restrictions which are implemented by the City to reduce customer demands are discussed in Section 4.1. There are no additional mandatory restrictions planned at this time.

4.5 Emergency Response Plan

The City has an emergency response plan (ERP) which details the responses to various emergency situations with human-caused and natural disasters that could potentially impact service area facilities and customers. The latest ERP was adopted in December 2021. It is provided as Appendix A.

4.6 Seismic Risk Assessment and Mitigation Plan

§10632.5 (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

§10632.5 (b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as

required by Section 10621.

§10632.5 (c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multi-hazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multi-hazard mitigation plan addresses seismic risk.

The City system has many facilities throughout the system that are considered crucial to service of customers. However, the system has enough redundancy with its backup generators that consumers still have access to water, even if one of the facilities goes down.

The https://myplan.caloes.ca.gov/ website provides an online tool for assessing information on shaking hazards, landslide zones, liquefaction, and fault lines. Using the online tool, there are no fault lines, landslide hazards, liquefaction hazards, fire severity zones, and flood/FEMA risks within the City's service area. In the event that there is a natural disaster that damages the facilities to the point of needing repair or damages to the structural integrity, the City has the capability for a lead time for repair, replacement, or recovery of operationally critical parts or equipment of 1 day to less than 3 days.

Using the City's Risk and Resilience assessment (RRA), the main facilities to the system are the Miramar Water Treatment Plant transmission line, Wheeler Booster Pump Station, and Plateau Booster Pump Station. The RRA is able to determine vulnerability likelihood. They are 12%, 3%, and 3%, respectively, for the previously mentioned facilities. These are relative to a potential earthquake that will make the facilities require repair or damage the structural integrity.

While the risk is low, mitigation can happen by constructing future facilities with structural integrity to resist natural disasters as reasonable and within acceptable standards. It is impractical to overdesign facilities for extreme scenarios. However, the City can reserve funds for maintenance as a mitigation method.

4.7 Shortage Response Action Effectiveness

Water Reduction: In general, water reduction per stage will reduce the gap between supply and demand by the respective stage's reduction goal (ex: maximum of 34,000 gallons for single-family residential during Stage 1). For those failing to comply, a penalty will be handed to water abusers.

Prohibited Washing Down of Hard and Paved Areas: Washing of hard surfaces such as driveways or sidewalks utilizes a significant amount of water. The average driveway utilizes as much as 150 gallons of water. While the size of surface varies, a large amount of water may be saved by not washing hard or paved surfaces.

Limited Practices for Washing Motorized Vehicles and Non-Motorized Equipment: The use of a hose to dispense potable water to wash a motor vehicle uses approximately 15-85 gallons of water. By prohibiting the usage of potable water to wash a motor vehicle, 15-85 gallons of water may be saved. Similar can be achieved by using a shut off nozzle for quick rinses or hand-held water containers.

Prohibited use of Non Re-circulating Equipment for Water Fountains and Decorative Water Features: Decorative water features require a source of water to be refilled. An outdoor decorative pond or fountain loses 3 to 5 inches of water on average per week. By restricting these decorative features from using potable water to be refilled, the gap between supply and demand can be minimized.

Prohibited watering within forty-eight hours of measurable precipitation: The average lawn will use approximately 125 gallons of water per 1,000 square feet on a hot sunny day. By reducing the amount of water being used for irrigating outdoor landscapes within 48 hours of measurable rainfall, the amount of water being conserved may measure up to the whole 125 gallons.

Prohibited Potable Water Irrigation of Public Street Medians: Similar to the restriction of washing hard or paved areas and, the size of median varies. The extent of water saved will change depending on size of median being watered.

Restricted Service for Drinking Water at Eating or Drinking Establishments: Restricting service for drinking water unless requested will prevent a significant amount of waste. The average cup size is 16 ounces.

Obligation to Fix Leaks, Breaks, or Malfunctions: The average family can waste up to 180 gallons per week from a household leak. Fixing a leak within the specified time for the respective hours per reduction stage will significantly reduce the amount of water wasted for up to 180 gallons per week.

Construction water for grading and other purposes: The use of water during construction projects can vary on the project size. During extreme water shortages the city will not allow the use of drinking water to be used for grading or construction.

Prohibited Installation of Single Pass Cooling Systems: Single pass cooling systems in new commercial buildings being prohibited prevents the waste of water.

Limited Days and Hours for Watering and Irrigating without Use of Drip Irrigation: As much as 50% of the water used outdoors is lost due to wind, evaporation, and runoff caused by inefficient irrigation methods. Watering during specified hours will save up to 25,000 gallons annually, or approximately 2,083 gallons monthly.

Prohibited Installation of Non Re-circulating Equipment in Commercial Car Wash and Laundromat Systems: A tunnel car wash with a moderate number of high-pressure applications could use up 120 gallons of water per vehicle, which is approximately a daily usage of 48,000 gallons of water under the assumption of 400 cars being washed on average per day. A laundromat may use approximately 3,000 gallons per day to clean laundry loads. By using a recycling water, up to 75% of the water used may be saved in a car wash. In laundering, 30% to 35% may be saved.

5 Communication Protocols

§10632 (a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(a) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(b) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(c) Any other relevant communications

Timely and effective communication is a key element of water shortage contingency planning implementation. In the event of a current or predicted water shortage, the City has multiple methods of communicating protocols to all customers. The City under all shortage reduction levels will notify their customers through posting on the City website, City Council meetings, protocols, public meetings, or a combination. They are displayed as Table 10 below.

Table 10 – Shortage Reduction Level to Notifications

Shortage Reduction Level	Notification
0-10%	City Website, City Council Meetings, Protocols, Public Meetings
10-20%	City Website, City Council Meetings, Protocols, Public Meetings
20-30%	City Website, City Council Meetings, Protocols, Public Meetings
30-40%	City Website, City Council Meetings, Protocols, Public Meetings
40-50%	City Website, City Council Meetings, Protocols, Public Meetings
Greater than 50%	City Website, City Council Meetings, Protocols, Public Meetings

6 Compliance and Enforcement

§10632 (a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

The City's Procedures outline a structured approach for monitoring and enforcing mandatory water use restrictions during declared water shortage emergencies. These procedures apply to all retail water customers and cover various restrictions such as landscape irrigation limits, vehicle washing prohibitions, and outdoor water use timing. Compliance is monitored through field inspections, meter data analysis, and customer reports with violations documented in a centralized database.

Enforcement follows a progressive approach beginning with a notice and warning phase, moving to administrative citations with monetary penalties for repeated violations, and culminating in service restrictions such as meter flow limitations for persistent non-compliance. Customers have defined obligations to cure violations and may appeal citations or request variances based on medical, business, or hardship grounds. The program also includes provisions for customer communication, education, and protections for vulnerable populations.

Roles and responsibilities are clearly assigned to ensure effective enforcement and customer support. Penalties and fees are structured to encourage compliance, with due process and confidentiality safeguards in place. The program undergoes regular review and adjustment

based on compliance data, customer feedback, and enforcement outcomes to maintain effectiveness and fairness.

7 Legal Authorities

§10632 (a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1. [see below]

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Water Code Section Division 1, Section 350
Declaration of water shortage emergency condition. The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

The legal authorities that are able to empower the urban water supplier to implement and enforce the shortage response actions per Title 13 SS 13.15.020 are the City Manager, Public Works Director or appointed designees for the City . As described in the City's Water Conservation, Use and Restriction Chapter 13.15 of their Municipal Code, there are penalties/violations for failure to comply with the shortage response actions. As explained in the chapter's enforcement section, "The city manager and the director of public works, and their appointed designees, shall have the duty and are authorized to enforce the provisions of this chapter and shall have the powers and authority contained in the California Penal Code Section 836.5, including the power to issue written notice to appear. Each law enforcement officer of the city shall, in connection with those duties empowered by law, diligently enforce the provisions of this chapter. (Ord. 1009 § 2, 2009; Ord. 822 § 3, 1991)."

The City shall declare a water shortage emergency to prevail within the area served whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the District to the extent that there would be insufficient water for human consumption, sanitation, and fire protection. In the course of issuing a possible proclamation of a local emergency, as defined in Section 8558 of the Government Code, the City shall coordinate with any and all cities or counties within which the City provides water service. The City shall declare a water shortage emergency in accordance with CA Water Code CHAPTER 3 - Water Shortage Emergencies § 350 – 358. Legal authorities include California Water Code Sections 71640-71644 Article 3. Water Shortages

and CA Water Code § 366 (2025) CHAPTER 3.3 - Excessive Residential Water Use During Drought.

8 Financial Consequences of WSCP

§10632 (a)(8). A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:
(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).
(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

To ensure compliance with CWC Chapter 3.3(commencing with Section 365), additional costs will be incurred to monitor and enforce WSCP actions. These costs will vary depending on the applicable water shortage stage and the duration of the water shortage emergency.

Financial consequences for drought conditions include, but are not limited to, reduced water use among customers, increased staff costs for tracking, reporting, patrolling, and enforcing actions, and providing communication efforts to inform customers about the WSCP. In preparation for a potential drought condition, the City maintains funds in their reserves that are specifically earmarked to address and mitigate fluctuations in revenue. The reduction of water usage will ultimately reduce revenue. These costs of compliance will vary depending on the stage being implemented.

In addition to and not a part of the base rate for water as established from time to time by the city council, penalty surcharges shall be levied for each and every customer who exceeds the baseline allowances as established from time to time by resolution or as specified in this chapter. Such penalty surcharges shall be based upon a bimonthly consumption or a daily equivalent for any pro-rated bill. All penalty surcharges are computed per thousand gallons or fraction thereof for each of the corresponding levels. Such penalty surcharges shall not be utilized to defray day-to-day operating or capital costs of the city's water system. (Ord. 1057 § 2, 2015; Ord. 1009 § 2, 2009; Ord. 822 § 3, 1991).

9 Monitoring and Reporting

§10632 (a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

The City's Supervisory Control and Data Acquisition (SCADA) system is a vital component for helping collect, track, and analyze water usage within the water system. The SCADA system is able to look at many data trends across all facilities, reservoirs, and pumps within the City. The City is currently in the process of converting to AMI which will provide the ability to closely track water use and locate water loss. Due to being crucial to the water system, funding for a SCADA system upgrade is included in the current budget.

10 WSCP Refinement Procedures

§10632 (a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

The WSCP is best prepared and implemented as an adaptive management plan. The City plans to use the results of the monitoring and reporting program to improve their WSCP, including the Shortage Response Actions. To ensure that the Shortage Response Actions are up to date and effective, the City will consider expanding, reducing, eliminating, or implementing new provisions after reviewing results and evaluating what was previously effective and ineffective.

11 Special Water Feature Distinction

§10632 (a)(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

Decorative water features are defined as water features which are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water features.

12 Plan Adoption, Submittal, and Availability

§10632 (a)(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

§10635(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

The City will make the water shortage contingency plan available to all its customers, and any city or county within which it provides water supplies, no later than 30 days after adoption of the water shortage contingency plan. Within 30 days after submission of the WSCP to DWR, the City will provide the WSCP to any city or county within which the City provides water.

Appendix A – ERP Emergency Response Plan



2021

Emergency Response Plan

Prepared for
The City of La Verne
3660 D Street
La Verne, CA 91750

Submitted December 2021







Prepared By

CIVILTEC engineering inc.
WWW.CIVILTEC.COM

Civil, Water, Wastewater, Drainage, Transportation and Electrical/Controls Engineering. Construction Management and Surveying

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Appendix A – Patrol Map

SCALE: 1"=2000'

Patrol Area 3

Patrol Area 2

Patrol Area 1

LEGEND

CITY BOUNDARY

SPHERE OF INFLUENCE

SPHERE OF INFLUENCE

SPHERE OF INFLUENCE

CITY OF LA VERNE

GOLDEN HILLS RD.

LIVE OAK RESERVOIR

ESPERANZA DR

CITY OF LA VERNE

CITY OF LA VERNE

COUNTY OF LOS ANGELES

SPHERE OF INFLUENCE

COUNTY OF LOS ANGELES

CITY OF CLAREMONT

BASELINE ROAD

WHEELER AVE

S. FRUIT ST.

WHEELER AVE.

B ST.

GAREY AVE.

CITY OF POMONA

BONITA AVE.

ARROW HWY.

CITY OF LA VERNE

CITY OF SAN DIMAS

ARROW HWY.

WHITE

CITY OF LA VERNE

CITY OF SAN DIMAS

CITY OF LA VERNE

CITY OF POMONA

FRANK G. BONELLI REGIONAL PARK

LOS ANGELES COUNTY FAIR GROUNDS

GAREY

CITY OF SAN DIMAS

CITY OF POMONA

CIVILTEC engineering inc
Civil, Water, Wastewater, Drainage, and Transportation Engineering
Land Development Surveying
California • Arizona
118 West Lime Avenue
Monrovia, CA 91016
Phone: 626.357.0588
Fax: 626.303.7957
Web: www.civiltec.com

CITY OF LA VERNE
2020 WATER MASTER PLAN

STUDY AREA

EXHIBIT 1

Appendix B – Information Sheets for Critical Locations and Patrol Area Condition Sheets

5th STREET FOREBAY AND BOOSTER FACILITY
2525 WHITE AVE **(normal level 5-13 feet / feeds zone 1)**

CONDITION OF OFFICE

CONDITION OF MAINTENANCE BUILDING

CHECK IF POWER AVAILABLE AND CONDITION OF ELECTRICAL AND MECHANICAL BOOSTER EQUIPMENT AND CHLORINATION UNIT

Additional Notes:

WHEELER BOOSTER AND RESERVOIR FACILITY
7311 CALLE ARAGON **(2 ea 3mg reservoirs / normal level 8-16 feet / feeds zone 1)**

CHECK SUCTION AND DISCHARGE LINES FOR CRACKS AND BROKEN CONNECTIONS

CHECK FOR POWER DISCONNECT

CHECK FOR STRUCTURAL DAMAGE

RESERVOIR

CHECK FOR EVIDENCE OF FAILURE OF SUBBASE

CHECK FOR LEAKS, CRACKS, BROKEN INLET-OUTLET PIPES, UNDERDRAINS

Additional Notes:

AMHERST RESERVOIR AND TREATMENT FACILITY **(2.5 mg / normal level 8-16 feet / feeds zone 1)**

CHECK IF POWER AVAILABLE AND CONDITION OF MECHANICAL AND ELECTRICAL EQUIPMENT

CHECK FOR AVAILABILITY AND QUALITY OF WATER

CHECK FOR CHEMICAL SPILLS OR RELEASES

CHECK FOR NEED TO INSTITUTE EMERGENCY CHLORINATION PLAN

CHECK FOR STRUCTURAL DAMAGE

16 LINE FROM WELL FIELD WILLIAMS 1, 2, AND 3

Additional Notes:

PLATEAU FOREBAY AND BOOSTER BASELINE @ LEROYS BOYS HOME **(10k gallons / normal level 5-10 feet / feeds zone 2)**

CHECK SUCTION AND DISCHARGE LINES FOR CRACKS AND BROKEN CONNECTIONS

CHECK FOR POWER DISCONNECT

CHECK FOR STRUCTURAL DAMAGE

Pressure Reducing Station

RESERVOIR

CHECK FOR FAILURE OF SUBBASE

CHECK FOR LEAKS, CRACKS, BROKEN INLET-OUTLET PIPES, UNDERDRAINS

CHECK ALL BOOSTER PUMPS

Additional Notes:

PLATEAU RESERVOIRS 1 & 2 NORTH OF BOWCOCK TRAIL @ LIVE OAK TRAILS END **(north of Brassie lane 2.5 mg normal level 9-20 feet and 5 mg normal level 16-27 feet / feeds zone 4)**

CHECK FOR EVIDENCE OF FAILURE OF SUBBASE

CHECK WATER LEVEL IN UNDERDRAIN COLLECTION MANHOLE
TIME:_____FEET_____INCHES_____FROM SURFACE

CHECK FOR LEAKS, CRACKS, BROKEN INLET-OUTLET PIPES

CHECK CIRCUMFRANCE FOR STRUCTURAL DAMAGE

ZONE 5 BOOSTER 7275 STEVENS RANCH ROAD

CHECK FOR STRUCTURAL DAMAGE

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

DEWENTER RESERVOIR 1 MILE NORTH OF END OF BRYDON ROAD **(.5 mg / normal level 8-15 feet / feeds zone 5)**

CHECK FOR EVIDENCE OF FAILURE OF SUBBASE

CHECK FOR STEEL BUCKLING AND OR LEAKAGE

CHECK IN AND OUT WATER LINES FOR LEAKS OR OTHER DAMAGE

OTHER RELATED COMMENTS

Additional Notes:

EMERALD RESERVOIRS 1 &2 / 5035 EMERALD AVE (1.5 mg normal level 15-21.5 feet / 3mg normal level 15-21.5 feet / feeds zone 2)

CHECK FOR EVIDENCE OF FAILURE OF SUBBASE

CHECK FOR CRACKS IN CONCRETE AND LEAKAGE

CHECK IN AND OUT WATER LINES FOR LEAKS OR OTHER DAMAGE

OTHER RELATED COMMENTS

Additional Notes:

MARSHALL CANYON RESERVOIR 7565 AVILA COURT (2.5 mg / normal level 8-15 feet / feeds zone 5)

CHECK FOR EVIDENCE OF FAILURE OF SUBBASE

CHECK FOR CRACKS IN CONCRETE AND LEAKAGE

CHECK IN AND OUT LINES FOR LEAKS OR OTHER DAMAGE

OTHER RELATED COMMENTS

Additional Notes:

MOUNTIAN SPRINGS RESERVOIR 5395
MOUNTIAN SPRINGS ROAD (1 mg normal level 14-26 feet / feeds zone 4)

CHECK FOR EVIDENCE OF FAILURE OF SUBBASE

CHECK FOR CRACKS IN CONCRETE OR LEAKAGE

CHECK IN AND OUT WATER LINES FOR LEAKS OR OTHER DAMAGE

OTHER COMMENTS

Additional Notes:

ZONE III RESERVOIR 7311 CALLE ARAGON

(2.5mg normal level 15-22.5 feet / feeds zone 3)

CHECK FOR EVIDENCE OF FAILURE OF SUBBASE

CHECK FOR CRACKS IN CONCRETE AND LEAKAGE

CHECK IN AND OUT LINES FOR LEAKS OR OTHER DAMAGE

OTHER RELATED COMMENTS

Additional Notes:

DAMIEN BOOSTER FACILTY 3600 DAMIEN AVE

CHECK FOR STRUCTUAL DAMAGE

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS BBROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

HILLCREST BOOSTER FACILITY 2761 HILLCREST DRIVE

CHECK FOR STRUICTUAL DAMAGE. (NOTE IF POWER IS OFF A MANUAL VENTILATOR WILL BE REQUIRED TO VENTILATE VAULT BEFORE ENTERING)

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

MCCALL BOOSTER FACILITY 2433 FOOTHILL BLVD

CHECK FOR STRUCTURAL DAMAGE

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTIINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

AMHERST WELL SITE 2898 AMHERST AVE

CHECK FOR STRUCTUAL DAMAGE AT SANITARY SEAL

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

CARTWRIGHT WELL SITE 2701 SHERWIN WAY

CHECK FOR STRUCTUAL DAMAGE TO THE SANITARY SEAL

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

LA VERNE HEIGHTS WELLS #1 & #2 4339 WILLIAMS AVE

CHECK FOR STRUCTUAL DAMAGE AT SANITARY SEAL

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

LA VERNE HEIGHTS #3 4080 N WILLAMS AVE

CHECK FOR STRUCTURAL DAMAGE AT SANITARY SEAL

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

LINCOLN WELL 2525 WHITE AVE

CHECK FOR STRUCTUAL DAMAGE AT THE SANITARY SEAL

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

MILLS TRACT WELL 2431 SIXTH STREET

CHECK SANITARY SEAL FOR STRUCTUAL DAMAGE

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

OLD BALDY WELL 1991 5TH STREET

CHECK SANITARY SEAL FOR STRUCTUAL DAMAGE

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAKS, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

Additional Notes:

WALNUT WELL 1922 WALNUT STREET

CHECK FOR STRUCTUAL DAMAGE TO SANITARY SEAL

CHECK FOR POWER DISCONNECT

CHECK DISCHARGE LINES FOR LEAK, BROKEN FITTINGS, CONNECTIONS

CHECK FLOW RATE

PATROL AREA #1

LOCATION CONDITION

PATROL AREA #2

LOCATION CONDITION

PATROL AREA #3

LOCATION CONDITION

Appendix C – Water Quality Emergency Notification Plan 2021

WATER QUALITY EMERGENCY NOTIFICATION PLAN

Name of Utility: City of La Verne

Physical Location/Address: 3660 D St. La Verne, Ca 91750

The following persons have been designated to implement the plan upon notification by the Division of Drinking Water (DDW) of the State Water Resources Control Board (SWRCB) that an imminent danger to the health of the water users exists:

Water Utility: Contact Name & Title	Email Address	Telephone Day	Evening	Cell
1. Richard J. Martinez, Utilities Manager	rjmartinez@cityoflaverne.org	909-596-8741	909-730-3504	909-730-3504
2. Ryan Ciotti, Water Production Supervisor	rciotti@cityoflaverne.org	909-596-8741	909-908-0589	909-908-0589
3. Anthony Ciotti, Deputy Director	aciotti@cityoflaverne.org	909-596-8741	909-702-3117	909-702-3117

The implementation of the plan will be carried out with the following State DDW and County Health Department personnel:

State DDW & County Health Department: Contact Name & Title	Telephone Day	Evening
1. Chi Diep, P.E., District Engineer SWRCB, Division of Drinking Water	(818) 551-2016 Fax (818) 551-2054	M (213) 309-3822
2. Juan Arriola, P.E., Associate Sanitary Engineer Meisam Hajimorad, Water Resource Control Engineer Natalie Melgoza, Water Resource Control Engineer Thomas Tsui, P.E., Associate Sanitary Engineer Karen Wong, P.E., Associate Sanitary Engineer SWRCB, Division of Drinking Water	(818) 551-2034 (818) 551-2039 (818) 551-2035 (818) 551-2036 (818) 551-2037	(310) 963-9644 (515) 520-7390 (626) 244-4676 (626) 757-4262 (626) 833-3828
3. Maurice Pantoja, Branch Director Fahrudin Zulcic, Service Manager Lusi Mkhitaryan, Chief, Drinking Water Program LA County DPH-Environmental Health Environmental Protection Branch–Local Primacy 5050 Commerce Drive Baldwin Park, CA 91706-1423	(626) 430-9438 (626) 430-5595 (626) 430-5420	(213) 270-5568 (213) 270-5568 (213) 270-5568

4. If the above personnel cannot be reached, contact:

Office of Emergency Services Warning Center (24 hrs) (800) 852-7550 or (916) 845-8911
When reporting a water quality emergency to the Warning Center, please ask for the California State Water Resources Control Board – Division of Drinking Water Duty Officer.

NOTIFICATION PLAN

Attach a written description of the method or combination of methods to be used (radio, television, door-to-door, sound truck, etc.) **to notify customers in an emergency.** For each section of your plan give an estimate of the time required, necessary personnel, estimated coverage, etc. Consideration must be given to special organizations (such as schools), non-English speaking groups, and outlying water users. Ensure that the notification procedures you describe are practical and that you will be able to actually implement them in the event of an emergency. Examples of notification plans are attached for large, medium and small communities.

Report prepared by:

Richard J Martinez, Utilities Manager
Signature and Title

March 18, 2021
Date

CITY OF LA VERNE
CITY HALL
3660 "D" Street, La Verne, California 91750

March 18, 2021

State Water Resources Control Board
Division of Drinking Water
500 North Central Avenue, Suite 500
Glendale, CA 91203

Subject: Water Quality Emergency Notification Plan

During regular working hours the Director of Public Works or the City Manager will contact the news media at television stations KCBS – News (818) 655-2000, KNBC – News (818) 684-4321 and KABC- Eyewitness News (818) 863-7777 to broadcast the necessary warnings. The local radio stations will also be contacted. The television and radio personnel are available at all hours. As a follow-up measure, we will also contact the Daily Bulletin (909) 987-6397, a local newspaper that serves La Verne and the surrounding area.

The warnings will be distributed in both English and Spanish to cover all members of the community. Outlying areas of the water service area will also be notified by sound-truck and/or handbill distributed to their respective areas.

A special telephone answering service or (reverse 911) can also be set up at City Hall to notify and answer questions that will come from consumers.

It is anticipated that the time for notification to the television and radio audiences will be very short. The areas served by handbill and sound truck will also be notified within four hours. For notification to be issued in other than normal hours the same media will be contacted and an announcement will be scheduled for as long as necessary. A sound-truck will be used in the early morning hours to quickly alert the people not listening to their radio or television.

Richard Martinez

Updated 3/18/2021

Appendix D – Unsafe Water Notices

PUBLIC NOTICE

CONSUMER ALERT DURING WATER OUTAGES OR PERIODS OF LOW PRESSURE

1. If you are experiencing water outages or low water pressure, immediately discontinue any non-essential water use. This includes all outdoor irrigation and car washing. Minimizing use will reduce the potential for the water system to lose pressure or run out of water. Please notify your water system if you experience an outage or low pressure.

2. If the water looks cloudy or dirty, you should not drink it. Upon return of normal water service, you should flush the hot and cold water lines until the water appears clear and the water quality returns to normal.

3. If you are concerned about the water quality or are uncertain of its safety, you may add eight drops of household bleach to one gallon of water and let it sit for 30 minutes or alternatively, if you are able, water can be boiled for one minute at a rolling boil to ensure it is safe for consumption.

4. Use of home treatment devices does not guarantee the water supply is safe after low pressure situations.

5. Do not be alarmed if you experience higher than normal chlorine concentrations in your water supply since the State Water Resources Control Board is advising public water utilities to increase chlorine residuals in areas subject to low pressure or outages.

6. The State Water Resources Control Board has also advised public water systems to increase the bacteriological water quality monitoring of the distribution system in areas subject to low pressure. This may include collecting samples in your area to confirm that the water remains safe for consumption. You will be promptly advised if the sampling reveals a water quality problem.

7. Your water system is committed to ensuring that an adequate quantity of clean, wholesome, and potable water is delivered to you. We recommend that you discuss the information in this notice with members of your family to assure that all family members are prepared should water outages or low water pressure occur.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Este aviso contiene información muy importante sobre su agua potable. Para una copia en español, favor de llamar al sistema de agua (xxx) xxx-xxxx.

[Water System Name] [Month/Day/Year]

BOIL WATER NOTICE

Boil Your Water Before Drinking or Food Preparation to Avoid Illness

Due to the recent [event (e.g., water outage, power outage, flood, fire, earthquake or other emergency)], which occurred on [date], the State Water Resources Control Board, Division of Drinking Water, the [County Name] County Health Department, and the [Water System name] Water System are advising residents of [City, Town, System] to only use boiled tap water or bottled water for drinking and cooking purposes as a safety precaution to avoid stomach or intestinal illness. The affected area includes: [INSERT GEOGRAPHICAL DESCRIPTION, STREET BOUNDARIES, ETC.]

We will inform you when tests show that water is safe to drink, and you no longer need to boil your water. We anticipate resolving the problem within [estimated time frame].

If you have questions about other uses of tap water, such as bathing and dish washing, please call your water system or read this guidance: https://www.cdc.gov/healthywater/emergency/dwa-comm-toolbox/before/tools/What-to-Do-During-a-Boil-Water-Advisory.docx

Optional: Potable water is available at the following locations: [List locations]

Please bring a clean water container (5 gallons maximum capacity).

Do not drink the water without boiling it first

- Boil all water for one (1) minute (rolling boil).
- Let water cool before drinking.
- Use boiled or bottled water for drinking, brushing teeth, and food preparation until further notice.
- Boiling water kills bacteria and other organisms in the water.

If you are unable to boil your water:

Household unscented liquid bleach

- For clear water, use 8 drops (1/8 tsp.) of bleach for 1 gallon of water. For cloudy water, filter through a clean cloth and use 16 drops (1/4 tsp.) of bleach for 1 gallon of water.
- Mix well. Allow to stand for 30 minutes before using.
- Water may taste or smell like chlorine. This means disinfection has occurred.

Water disinfection tablets

- Please follow the manufacturer's instructions.

For More Information

If you are concerned about your health or the health of a family member, contact your health care provider or [local health department].

Water Utility contact: [Utility Representative Name, title, phone & address]
State Water Resources Control Board District Office: [(XXX) XXX-XXXX]
Local Environmental Health Jurisdiction: [XXXXX County at (XXX) XXX-XXXX]

Please share or post this information with others who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

INFORMACION IMPORTANTE SOBRE SU AGUA POTABLE

Este aviso contiene información muy importante sobre su agua potable, por favor léalo bien.

[Water System Name] [XX/XX/XXXX]

AVISO DE HERVIR EL AGUA

Para Evitar Enfermarse, Hierva Su Agua Antes de Beberla o Preparar Comida

Debido al reciente [evento (ejemplo: corte de agua, corte de luz, inundación, incendio, temblor u otra situación de emergencia)], el cual ocurrió en [date], la Junta Estatal de Control de Recursos de Agua (División de Agua Potable), el [County Name] County Health Department, y el Sistema de Agua [Water System name], están advirtiéndoles a los residentes de [City, Town, System] que como precaución de seguridad, solo usen agua de la llave hervida o agua embotellada para beber y para cocinar. Esto es para evitar enfermedad intestinal o del estómago. El área afecta- da incluye: [INSERT GEOGRAPHHICAL DESCRIPTION, STREET BOUNDARIES, ETC.]

Le informaremos cuando las pruebas muestren que el agua es segura para beber y usted ya no tenga que hervir su agua. Esperamos resolver el problema dentro de [estimated time frame].

Si tiene preguntas sobre el agua de la llave para otros usos, como para bañarse, y lavar los trastes, favor de llamar a su sistema de agua o lea esta guía: https://www.cdc.gov/healthywater/emergency/dwa-comm-toolbox/before/tools/What-to-Do-During-a-Boil-Water-Advisory.docx

Opcional: En los siguientes lugares hay Agua Potable disponible: [List locations]. Favor de llevar un contenedor limpio para el agua (de 5 galones máximos de capacidad).

No beba el agua sin antes hervirla

- Hierva toda el agua por un (1) minuto (a punto de ebullición).
- Deje enfriar el agua antes de beberla.
- Hasta nuevo aviso, use agua hervida o embotellada para beber, lavarse los dientes, y para preparar comida.
- Hervir el agua mata las bacterias y otros organismos en el agua.

Si no puede hervir su agua

Puede usar blanqueador sin olor de uso doméstico (household bleach)

- Para agua clara, agregue 8 gotas (1/8 de cucharadita) de blanqueador para 1 galón de agua. Para agua turbia, use una prenda de ropa limpia para filtrarla, y agregue 16 gotas (1/4 de cucharadita) de blanqueador para 1 galón de agua turbia.
- Mezcle bien. Deje reposar el agua por 30 minutos antes de usarla.
- Puede ser que el agua sepa o huela a blanqueador. Esto significa que el agua ha sido desinfectada.

Tabletas desinfectantes de agua

- Siga las instrucciones del fabricante.

Para más información

Si está preocupado por su salud o la salud de un miembro de la familia, contacte a su proveedor de salud o a [local health department].

Representante del Proveedor de Servicio de Agua: [Utility representative Name, title, phone & address]
Oficina de Distrito de la Junta Estatal de Agua: [(XXX) XXX-XXXX]
Jurisdicción de Salud Ambiental Local: [XXXXX County at (XXX) XXX-XXXX]

Por favor publique o comparta esta información con otras personas que beben esta agua, especialmente aquellos que no hayan recibido este aviso directamente (por ejemplo, las personas en apartamentos, asilos, escuelas, y negocios). Puede hacerlo poniendo este aviso en un lugar público o distribuyendo copias en persona o por correo.

CANCELLATION OF BOIL WATER NOTICE

[NAME OF UTILITY]
[DATE]

On [Date of boil water notice] you were notified of the need to boil/disinfect all tap water used for drinking and cooking purposes.

The [Water System Name] Water System in conjunction with the State Water Resources Control Board [, and/or Name of Local Primacy Agency (if applicable)], has determined that, through abatement of the health hazard and comprehensive testing of the water, your water is safe to drink. **It is no longer necessary to boil your tap water or for you to consume bottled water.**

For more information call:

Water Utility contact: [Name, title, and phone number or email of utility representative]

State Water Resources Control Board: [Name, title, and phone number or email of overseeing DDW District]

Local Environmental Health Jurisdiction: [Name, title, and phone number or email of overseeing LPA (if applicable)]

CANCELACIÓN DEL AVISO DE HERVIR EL AGUA

[NOMBRE DEL SERVICIO DE AGUA]
[Fecha]

El [Fecha] le notificaron que tenía que hervir o desinfectar toda el agua de la llave que utilizara para beber y cocinar.

El Sistema de Agua de [Water System Name] junto con la Junta Estatal de Control de Recursos de Agua, o la Jurisdicción Local de Salud Ambiental han determinado tras la supresión del riesgo de salud, seguido por un análisis completo del agua, que puede beber el agua de su llave sin peligro. **Ya no es necesario que hierva el agua de su llave ni que consuma agua de botella.**

Para más información llame a:

Contacto en el Servicio de Agua: [Name, title, and phone number or email of utility representative]

Junta Estatal de Control de Recursos de Agua: [Name, title, and phone number or email of overseeing DDW District]

Jurisdicción Local de Salud Ambiental: [Name, title, and phone number or email of overseeing LPA (if applicable)]

Date:

UNSAFE WATER ALERT

[Insert one-liner language other than Spanish here, if needed, otherwise delete.]

[System Name] water is possibly contaminated with [an unknown substance]

DO NOT DRINK YOUR WATER

Failure to follow this advisory could result in illness.

An unknown substance has been added to the drinking water supplied by the [Water System Name] due to a recent [intrusion; break-in] at [one of the wells; our treatment plant; storage tank; specific facility]. The State Water Resources Control Board, [County Name] County Health Department, and [Water System name] Water System are advising residents of [City, Town, System] to NOT USE THE TAP WATER FOR DRINKING AND COOKING UNTIL FURTHER NOTICE.

What should I do?

- **DO NOT DRINK YOUR TAP WATER---USE ONLY BOTTLED WATER.** Bottled water should be used for all drinking (including baby formula and juice), brushing teeth, washing dishes, making ice and food preparation **until further notice**.

- **DO NOT TRY AND TREAT THE WATER YOURSELF.** Boiling, freezing, filtering, adding chlorine or other disinfectants, or letting water stand will not make the water safe.

- Optional: Potable water is available at the following locations: [List locations]
  Please bring a clean water container (5 gallons maximum capacity).

We will inform you when tests show that the water is safe again. We expect to resolve the problem within [estimated time frame].

For more information call:
Water Utility contact: [Name, title, phone & address of responsible utility representative].
State Water Resources Control Board at: [insert local district office, DE and phone number].
Local County Health Department: [insert phone number of local health department].

This notice is being sent to you by [insert water system name]. California Public Water System ID # [XXXXXXX]. Date Distributed: [date].

Please share this information with all other people who receive this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

Date:

ALERTA DE AGUA NO SEGURA

[Insert one-liner language other than Spanish here, if needed, otherwise delete.]

El agua de [System Name] posiblemente está contaminada con [an unknown substance]

NO BEBA SU AGUA

Si descarta ésta advertencia puede enfermarse

Una sustancia desconocida fue agregada al agua potable suministrada por [Water System Name], esto fue debido a una reciente [intrusion; break-in] en [uno de los pozos; nuestra planta de tratamiento; tanque de almacenamiento; instalaciones específicas]. La Junta Estatal de Control de Recursos de Agua, el [County Name] County Health Department, y el Sistema de Agua [Water System name], están advirtiéndoles a los residentes de [City, Town, System] que NO USEN EL AGUA DE LA LLAVE PARA BEBER Y COCINAR HASTA NUEVO AVISO.

¿Qué debo hacer?

- **NO BEBA AGUA DE LA LLAVE---SOLO USE AGUA EMBOTELLADA.** Se debería usar agua embotellada para todas las bebidas (incluyendo formula de bebés y jugo), para lavarse los dientes, lavar trastes, hacer hielo y preparar comida **hasta nuevo aviso**.

- **NO INTENTE TRATAR EL AGUA USTED MISMO.** Hervir, congelar, filtrar, agregar cloro (chlorine) u otros desinfectantes, o dejar que el agua repose, no hará que el agua sea segura.

- Optional: Hay agua potable disponible en los siguientes lugares: [List locations]
  Por favor traiga un contenedor limpio para el agua (de 5 galones máximos de capacidad).

Le informaremos cuando las pruebas muestren que el agua es segura otra vez. Esperamos resolver el problema dentro de [estimated time frame].

Para más información llame a:
Contacto del Servicio de Agua: [Name, title, phone & address of responsible utility representative].
Junta Estatal de Control de Recursos de Agua (State Water Resources Control Board): [insert local district office, DE and phone number].
Departmento Local de Salud del Condado: [insert phone number of local health department].

Este aviso es enviado a usted por [insert water system name]. Núm. de Identificación de California del Sistema de Agua Público [XXXXXXX]. Fecha de distribución: [date].

Por favor comparta esta información con todas las demás personas que reciben esta agua, especialmente aquellos que no hayan recibido éste aviso directamente (por ejemplo, las personas en apartamentos, asilos, escuelas, y negocios). Puede hacerlo poniendo este aviso en un lugar público o distribuyendo copias en persona.

Last updated – 12/08/14

Date:

UNSAFE WATER ALERT

[Insert one-liner language other than Spanish here, otherwise delete.]

[System Name] water is possibly contaminated with [an unknown substance]

DO NOT USE YOUR WATER

Failure to follow this advisory could result in illness.

An unknown substance has been added to the drinking water supplied by the [Water System Name] due to a recent [intrusion; break-in] at [one of the wells; our treatment plant; storage tank; specific facility]. The State Water Resources Control Board, [County Name] County Health Department, and [Water System name] Water System are advising residents of [City, Town, System] to NOT USE THE TAP WATER FOR DRINKING, COOKING, HAND WASHING, OR BATHING UNTIL FURTHER NOTICE.

What should I do?

- **DO NOT USE YOUR TAP WATER---USE ONLY BOTTLED WATER.** Bottled water should be used for all drinking (including baby formula and juice), brushing teeth, washing dishes, making ice, food preparation and bathing **until further notice**.

- **DO NOT TRY AND TREAT THE WATER YOURSELF.** Boiling, freezing, filtering, adding chlorine or other disinfectants, or letting water stand will not make the water safe.

- Optional: Potable water is available at the following locations: [List locations]
  Please bring a clean water container (5 gallons maximum capacity).

We will inform you when tests show that the water is safe again. We expect to resolve the problem within [estimated time frame].

For more information call:
Water Utility contact: [Name, title, phone & address of responsible utility representative].
State Water Resources Control Board at: [insert local district office, DE and phone number].
Local County Health Department: [insert phone number of local health department].

This notice is being sent to you by [insert water system name]. California Public Water System ID # [XXXXXXX]. Date Distributed: [date].

> *Please share this information with all other people who receive this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.*

Last updated – 12/08/14

Date:

ALERTA DE AGUA NO SEGURA

[Insert one-liner language other than Spanish here, if needed, otherwise delete.]

El agua de [System Name] posiblemente está contaminada con [an unknown substance]

NO USE SU AGUA

Si descarta ésta advertencia puede enfermarse

Una sustancia desconocida fue agregada al agua potable suministrada por [Water System Name], esto fue debido a una reciente [intrusion; break-in] en [uno de los pozos; nuestra planta de tratamiento; tanque de almacenamiento; instalaciones específicas]. La Junta Estatal de Control de Recursos de Agua, el [County Name] County Health Department, y el Sistema de Agua [Water System name], están advirtiéndoles a los residentes de [City, Town, System] que NO USEN EL AGUA DE LA LLAVE PARA BEBER, COCINAR, LAVARSE LAS MANOS, O BAÑARSE HASTA NUEVO AVISO.

¿Qué debo hacer?

- **NO USE AGUA DE LA LLAVE---SOLO USE AGUA EMBOTELLADA.** Se debería usar agua embotellada para todas las bebidas (incluyendo formula de bebés y jugo), para lavarse los dientes, lavar trastes, hacer hielo, preparar comida, y bañarse **hasta nuevo aviso**.

- **NO INTENTE TRATAR EL AGUA USTED MISMO.** Hervir, congelar, filtrar, agregar cloro (chlorine) u otros desinfectantes, o dejar que el agua repose, no hará que el agua sea segura.

- Optional: Hay agua potable disponible en los siguientes lugares: [List locations]
  Por favor traiga un contenedor limpio para el agua (de 5 galones máximos de capacidad).

Le informaremos cuando las pruebas muestren que el agua es segura otra vez. Esperamos resolver el problema dentro de [estimated time frame].

Para más información llame a:
Contacto del Servicio de Agua: [Name, title, phone & address of responsible utility representative].
Junta Estatal de Control de Recursos de Agua (State Water Resources Control Board): [insert local district office, DE and phone number].
Departmento Local de Salud del Condado: [insert phone number of local health department].

Este aviso es enviado a usted por [insert water system name]. Núm. de Identificación de California del Sistema de Agua Público [XXXXXXX]. Fecha de distribución: [date].

Por favor comparta esta información con todas las demás personas que reciben esta agua, especialmente aquellos que no hayan recibido éste aviso directamente (por ejemplo, las personas en apartamentos, asilos, escuelas, y negocios). Puede hacerlo poniendo este aviso en un lugar público o distribuyendo copias en persona.

Last updated – 12/9/14

Appendix E – Amount of Chlorine per 100 Gallon Barrel

Table 3-4 Amount of Chlorine per 100 Gallon Barrel

Solution Strength / Type of Chlorine	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
5% Bleach Household Bleach (Clorox)	60 gal	80 gal	100 gal								
12.5% Bleach Commercial Bleach	24 gal	32 gal	40 gal	48 gal	56 gal	64 gal	72 gal	80 gal	88 gal	96 gal	
65% Calcium Hypochlorite (HTH, tablets or granular chlorine)	38 lbs	51 lbs	64 lbs	77 lbs	90 lbs	103 lbs	116 lbs	128 lbs	141 lbs	154 lbs	167 lbs

Appendix F – Chlorine Volume Required Gallons Per Day (GPD) Per mg/L or PPM of Desired Chlorine Dosage

Table 3-5 Chlorine Volume Required Gallons Per Day (GPD) Per mg/L or PPM of Desired Chlorine Dosage

Solution Strength / Flow Rate	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
50 gpm	2.4	1.8	1.4	1.2	1.03	0.9	0.8	0.7	0.7	0.6	0.6
75 gpm	3.6	2.7	2.2	1.8	1.5	1.4	1.2	1.1	1.0	0.9	0.8
100 gpm	4.8	3.6	2.9	2.4	2.1	1.8	1.6	1.4	1.3	1.2	1.1
300 gpm	14.4	10.8	8.6	7.2	6.2	5.4	4.8	4.3	3.9	3.6	3.3
500 gpm	24.0	18.0	14.4	12.0	10.3	9.0	8.0	7.2	6.6	6.0	5.5
800 gpm	38.4	28.8	23.0	19.2	16.5	14.4	12.8	11.5	10.5	9.6	8.9
1000 gpm	48.0	36.0	28.8	24.0	20.6	18.0	16.0	14.4	13.1	12.0	11.1
1500 gpm	72.0	54.0	21.5	36.0	30.9	27.0	24.0	21.6	19.6	18.0	16.6
2000 gpm	96.0	72.0	57.6	48.0	41.1	36.0	32.0	28.8	26.2	24.0	22.2

Appendix G – CA JPIA Significant Incident Form

CONFIDENTIAL: Prepared in anticipation of litigation at the request of California JPIA defense counsel.



INSTRUCTIONS

Agency employees are encouraged to notify their agency risk manager upon receipt of knowledge or witnessing an occurrence or transaction from which a potential claim could result or in which the agency could be liable. The agency risk manager should provide this form to the assigned California JPIA regional risk manager. This information will give the California JPIA the opportunity to perform pre-claim investigation of a significant incident. Prompt reporting is more important than having completed all of the information. Reporting should not be delayed while awaiting additional information.

WHAT TO DO IN CASE OF A SIGNIFICANT INCIDENT

1. **DO NOT MAKE ANY STATEMENTS OR OPINIONS REGARDING CAUSE, FAULT, OR LIABILITY.**

2. Notify agency risk manager as soon as possible.

3. Complete this form as follows:
   - A. Enter the date, time, and location of the incident.
   - B. Identify and enter the name of the person(s) sustaining injury or a description of the property damages, if applicable.
   - C. Describe the exact location where the incident occurred.
   - D. Briefly describe how the incident occurred.
   - E. Briefly describe the damages or injuries observed.
   - F. Describe weather conditions (was surface condition slippery, etc.).
   - G. Obtain names, addresses and telephone numbers of persons involved or witnessing the incident.

4. If the person involved makes statements about filing a claim to you, advise that claims must be made with the agency clerk.

5. If the person does not make statements about filing a claim to you, do not volunteer information. This is an internal report. Do not provide copies of this report to other parties.

6. If contacted by the Risk Manager or a California Joint Powers Insurance Authority representative, furnish requested information as accurately and as quickly as possible.

7. All persons, other than agency personnel, seeking accident information should be referred to the agency clerk or risk manager.

8. Give other persons involved your name and agency address.

9. Please include newspaper clippings, police reports or other supplementary information you may have relating to this incident.

CLEAR FORM

CONFIDENTIAL: Prepared in anticipation of litigation at the request of California JPIA defense counsel.

FROM: AGENCY NAME	ADDRESS:	**Email completed forms to: your agency risk manager**

SUBJECT: REPORT OF SIGNIFICANT INCIDENT ***(ATTACH ADDITIONAL SHEETS, IF NEEDED)***

POTENTIAL CLAIMANT NAME ADDRESS PHONE	DATE AND TIME OF REPORT MONTH DAY YEAR TIME AM PM

A. COMPLETE FOR ALL INCIDENTS

DATE AND TIME OF ACCIDENT MONTH DAY YEAR TIME AM PM	LOCATION:	LEAD POLICE OFFICER ON SITE

B. COMPLETE ONLY IF AGENCY VEHICLE OR EQUIPMENT IS INVOLVED

VEHICLE NO.	YEAR	MAKE	MODEL	OWNER
EMPLOYEE OR DRIVER		ADDRESS	AGE	PHONE NUMBER
PURPOSE OF USE			USED WITH PERMISSION	YES NO

C. COMPLETE ONLY IF OTHER PROPERTY IS DAMAGED

OWNER	ADDRESS	PHONE NUMBER
OTHER DRIVER	ADDRESS	PHONE NUMBER

DESCRIPTION OF PROPERTY OR AUTO	YEAR	MAKE	MODEL	LICENSE NO.	DESCRIBE DAMAGE

D. COMPLETE ONLY IF SOMEONE IS INJURED

NAME	ADDRESS	PHONE NUMBER	AGE

E. COMPLETE FOR ALL INCIDENTS

DESCRIBE INCIDENT-STATE FACTUAL POINTS ONLY - DO NOT GIVE OPINIONS AS TO FAULT, NEGLIGENCE, OR LIABILITY

F. WEATHER CONDITIONS SUNNY RAINY OVERCAST WINDY DESCRIBE:

DESCRIBE

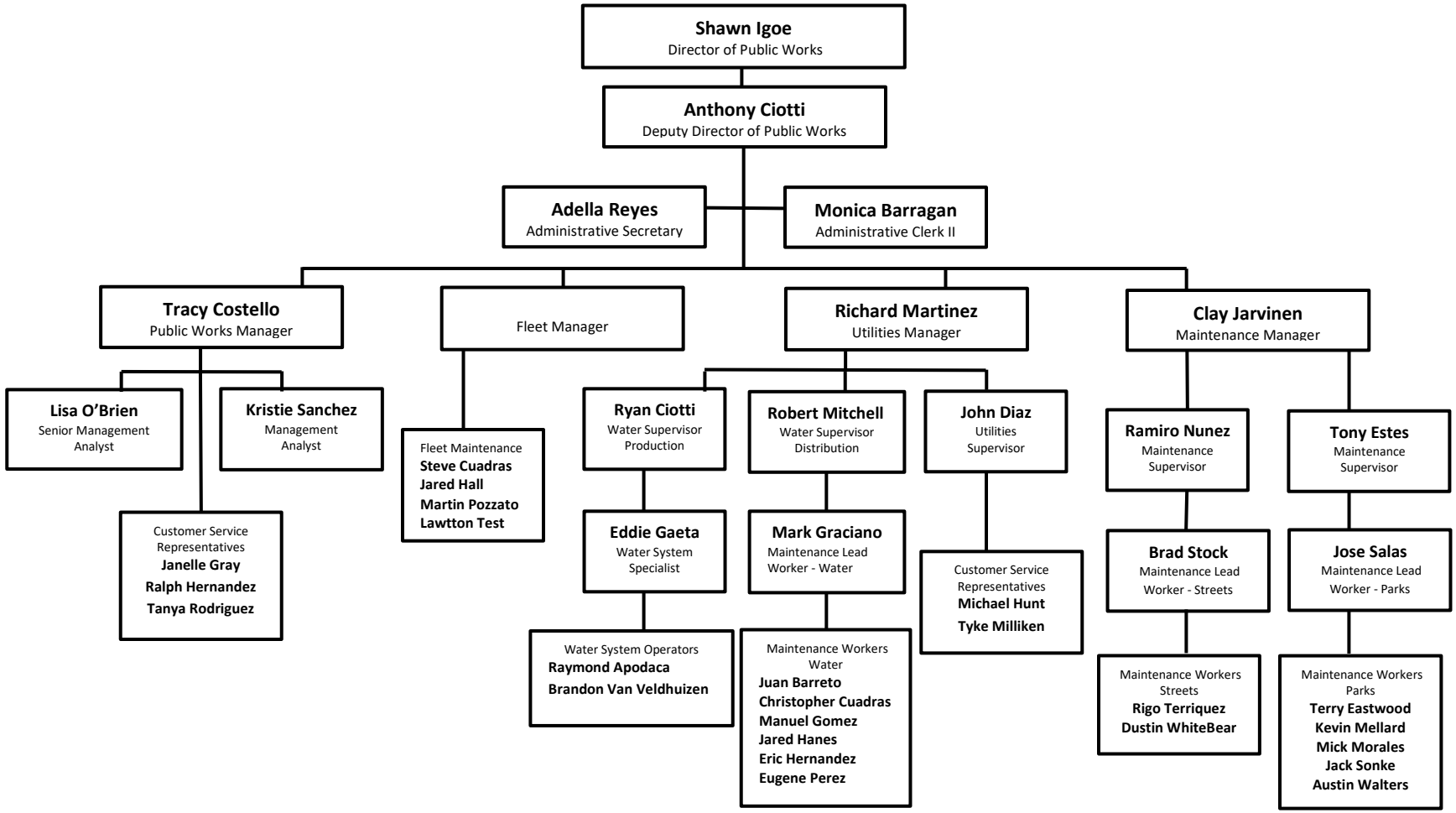
G. WITNESS

NAME	ADDRESS	PHONE NUMBER

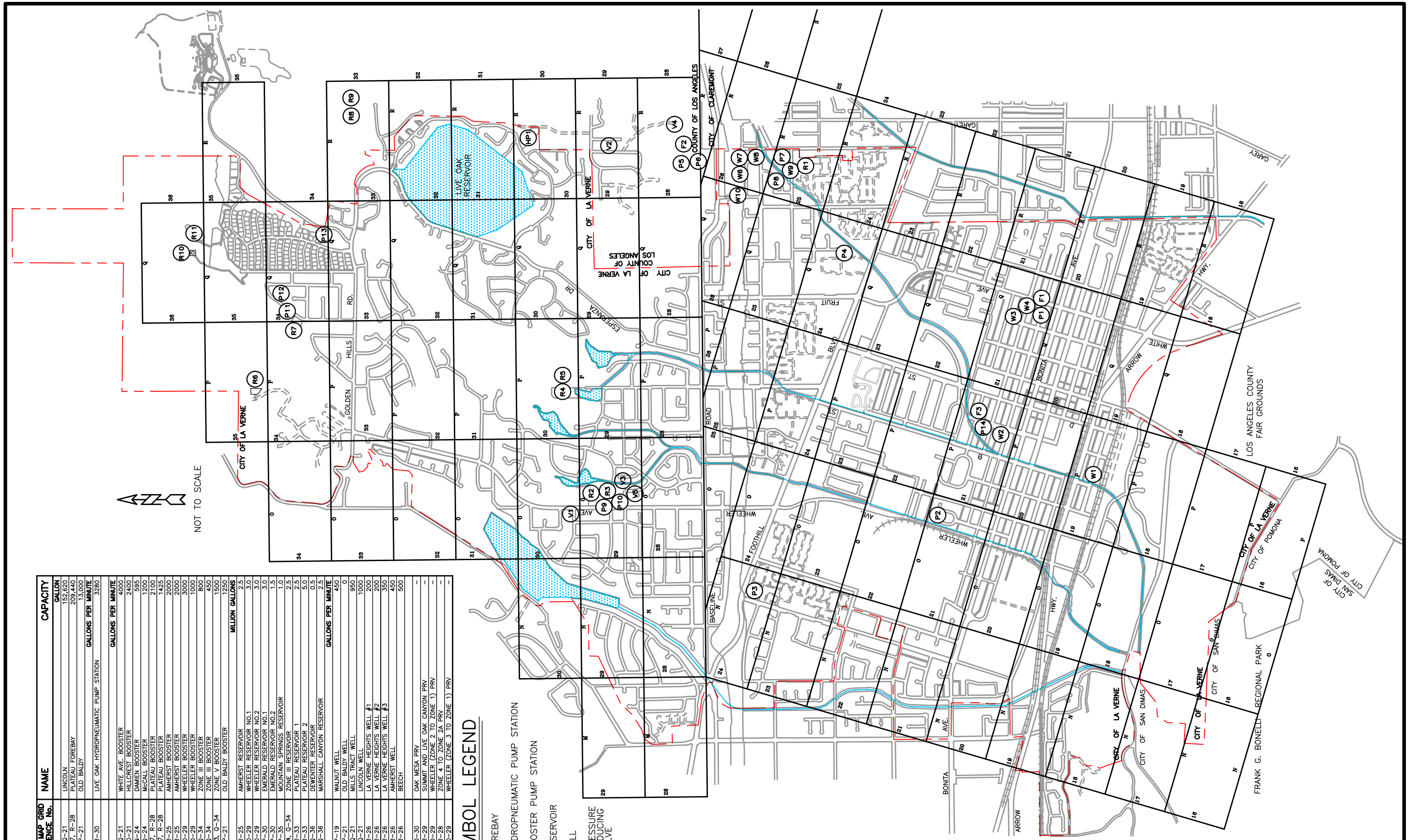
WAS RISK MANAGER NOTIFIED? YES NO	DATE	TIME AM PM	BY WHOM?

Appendix H – Public Works Organization Chart-Rev Apr 2021

City of La Verne Public Works



Appendix I – Existing Water System Facilities



SYMBOL LEGEND

- F# — FOREBAY
- HP# — HYDROPNEUMATIC PUMP STATION
- P# — BOOSTER PUMP STATION
- R# — RESERVOIR
- W# — WELL
- V# — PRESSURE REDUCING VALVE

No.	ATLAS MAP GRID REFERENCE No.	NAME	CAPACITY
			GALLON
F1	Q–21	LINCOLN	152,620
F2	R–27, R–28	PLATEAU FOREBAY	209,440
F3	P–21	OLD BALDY	13,000
			GALLONS PER MINUTE
HP1	R–30	LIVE OAK HYDROPNEUMATIC PUMP STATION	3280
			GALLONS PER MINUTE
P1	Q–21	WHITE AVE. BOOSTER	4000
P2	O–21	HILLCREST BOOSTER	2400
P3	N–24	DAMIEN BOOSTER	595
P4	Q–24	McCALL BOOSTER	1200
P5	R–27, R–28	PLATEAU BOOSTER	2100
P6	R–27, R–28	PLATEAU BOOSTER	1425
P7	R–25	AMHERST BOOSTER	2000
P8	R–25	AMHERST BOOSTER	2000
P9	O–29	WHEELER BOOSTER	3000
P10	O–29	WHEELER BOOSTER	1000
P11	Q–34	ZONE III BOOSTER	800
P12	Q–34	ZONE III BOOSTER	450
P13	Q–33, Q–34	ZONE V BOOSTER	1500
P14	P–21	OLD BALDY BOOSTER	1250
			MILLION GALLONS
R1	R–25	AMHERST RESERVOIR	2.5
R2	O–29	WHEELER RESERVOIR NO.1	3.0
R3	O–29	WHEELER RESERVOIR NO.2	3.0
R4	P–30	EMERALD RESERVOIR NO.1	3.0
R5	P–30	EMERALD RESERVOIR NO.2	1.5
R6	P–35	MOUNTAIN SPRINGS RESERVOIR	1.0
R7	P–34, Q–34	ZONE III RESERVOIR	2.5
R8	R–33	PLATEAU RESERVOIR 1	2.5
R9	R–33	PLATEAU RESERVOIR 2	5.0
R10	Q–36	DEWENTER RESERVOIR	0.5
R11	Q–36	MARSHALL CANYON RESERVOIR	2.5
			GALLONS PER MINUTE
W1	P–19	WALNUT WELL	450
W2	P–21	OLD BALDY WELL	0
W3	O–21	MILLS TRACT WELL	950
W4	O–21	LINCOLN WELL	1000
W5	R–26	LA VERNE HEIGHTS WELL #1	200
W6	R–26	LA VERNE HEIGHTS WELL #2	200
W7	R–26	LA VERNE HEIGHTS WELL #3	350
W8	R–26	AMHERST WELL	450
W9	R–26	BEECH	500
W10	O–30	OAK MESA PRV	–
V1	O–30	SUMMIT AND LIVE OAK CANYON PRV	–
V2	R–29	WHEELER (ZONE 2 TO ZONE 1) PRV	–
V3	O–29	ZONE 4 TO ZONE 2A PRV	–
V4	R–28	WHEELER (ZONE 3 TO ZONE 1) PRV	–
V5	O–29		–

118 West Lime Avenue
Monrovia, CA 91016
Phone: 626.357.0588
Fax: 626.303.7957
Web: www.civiltec.com

CIVILTEC engineering inc.
Civil, Water, Wastewater, Drainage, and Transportation Engineering • Construction Management • Surveying
California • Arizona

CITY OF LA VERNE
2021 EMERGENCY RESPONSE PLAN

EXISTING WATER SYSTEM FACILITIES

APPENDIX

I

Appendix J – Mitigation Actions

Appendix J - Mitigation Actions

Actions can be taken to obviate or significantly lessen the impact of a malevolent act or natural hazard effecting the supply of drinking water provided to the community. This section illustrates the possible ways that can be used to mitigate or reduce the impact of malevolent acts or natural hazards.

This appendix will discuss current mitigations actions which are currently in place as well as recommended mitigation actions for the following situations:

- Alternative source water options for when system is unable to supply customers fully (Import water and emergency interconnections)
- The loss of power (with regard to active booster and hydropneumatic stations and SCADA)
- SCADA system intrusion
- Unauthorized access into City facilities (Physical security measures for assets)
- Main line breakages

Alternative Source Water Options and Interconnected Utilities

Alternative sources of water and interconnected utilities help provide backup to the City's source of water when main facilities may be inoperable. The City has several interconnections that can be used to import water. There are seven imported water interconnections and two emergency interties.

Imported Interconnections

Imported water is received through seven connections from the Three Valleys Municipal Water District (TVMWD) Miramar Water Treatment Plant via the Miramar Transmission System. Information on these interconnections is shown in the table below.

Water System Interconnection Data

Connection	Location	Flow Rate (cfs)
6th Street and White Avenue	Lincoln Park	8
5th Street and White Avenue	5th Street and White Avenue	8
5th and C Streets	5th and C Streets	3
Williams Avenue	Baseline Road and Williams Avenue	8

Connection	Location	Flow Rate (cfs)
Amherst Street	Williams Avenue and Amherst Street	3
Emerald Avenue	Baseline Road and Emerald Avenue	6
Wheeler Avenue	Baseline Road and Wheeler Avenue	6
Total		**42**

Emergency Interconnections

When groundwater sources are unavailable due to unforeseen emergencies, mitigation of the depleted water supply can be obtaining more water supply through these interconnections. In the event where these interconnections are not enough to supply the system demand, water can further be acquired through emergency interconnections.

Emergency supply is available through one connection on the Pomona Walnut Rowland Joint Feeder (PWRJF) from the Metropolitan Water District (MWD) Weymouth Filtration Water Treatment Plant. Another connection is available from the Golden State Water Company (GSWC) Foothill District intertie at Pattiglen and Bonita Avenues. This emergency connection has pressure differentials between the City and GSCW and has not been used in recent years.

All zones are interconnected by manually operated zone valves located at numerous, strategic locations. These zone valve covers are painted red for proper identification. Water can be transferred from higher zones into lower zones when an emergency occurs. The following interties in the table below provide emergency supplies that are available for the City to attain:

Emergency Water Interconnection Data

Source	Location
PWRJF	MWD Weymouth Filtration WTP
GSWC Intertie	Pattiglen and Bonita Avenue

Power Loss

Power loss can cause many key facilities within the City to be unable to function. Preparing for such an incident is crucial to maintaining operation.

Active Booster and Hydropneumatic Station Pumps

Backup power for essential source pumps and booster pumping stations is beneficial in the case of an incident causing power loss. There are ten active booster pump stations in the City and one active hydropneumatic pump station for a total of 38 booster pumps. These active booster stations and hydropneumatic station and their pumps can be found in the table below. See **Appendix I** for a map containing the locations of these existing water system facilities.

Active Booster and Hydropneumatic Station Pumps

Pump Station	From	To	Type of Station	Number of Pumps
White Avenue	Forebay	Pressure Zone I	Booster	4
Old Baldy	Forebay	Pressure Zone I	Booster	1
Hillcrest	PWR	Pressure Zone I	Booster	2
Damien	Pressure Zone I	Pressure Zone II	Booster	1
McCall	Pressure Zone I	Pressure Zone II	Booster	2
Plateau	Forebay	Pressure Zone IV	Booster	3
	Miramar #4	Pressure Zone IV	Booster	4
Amherst	Pressure Zone I	Pressure Zone II	Booster	2
	Pressure Zone I	Plateau	Booster	2
Wheeler	Pressure Zone I	Pressure Zone III	Booster	3
	Pressure Zone I	Pressure Zone II	Booster	1
Pressure Zone III	Pressure Zone III	Pressure Zone IV	Booster	3
	Pressure Zone III	Pressure Zone V	Booster	2
Pressure Zone V	Pressure Zone IV	Pressure Zone V	Booster	3
Live Oak	Pressure Zone IV	Pressure Zone IVa	Hydro-pneumatic	5
Total				**38**

The City currently has two portable generators and the ability to connect them to critical facilities. These portable generators can be used to supply power to any pump stations that require power.

The installation of five transfer switches at the White BPS, Wheeler BPS, Plateau BPS, Live Oak Hydro Station and Pressure Zone V plants was done for emergency preparedness.

There are currently **two portable generators** to be shared among these plants during prolonged power outages to pump water from Pressure Zone I to the higher zones. A study of generator staging protocol was done in order to determine how generators should be moved in an emergency.

Possible Recommendations

As an additional mitigation action, the City would like to install permanent generators at the Live Oak Hydro Station in the future by attaining potential funding.

SCADA

The City's SCADA system is also vulnerable when there is a loss of power. The telemetry computer is maintained in the production office located at 2525 White Avenue. The computers (one primary and one backup server) and all remote locations are backed up by **batteries that can supply up to 36 hours of operation in the event of a power failure**. The production office is also backed up by a Cummins Standby generator (85KW) that will keep the SCADA system operating in the event of a power outage.

SCADA System Intrusion/Cyber Security

An attack on SCADA system could cause detrimental harm to a water system. The City's SCADA system was installed and then upgraded in 2006 in order to control and monitor the water system.

All critical functions of the production system, excluding valve control, can be controlled and monitored from the central computer servers. These include well and pump control, reservoir level, and data management tasks. The computer also monitors all functions of the system and stores data relative to those tasks.

The components of the SCADA system are shown in the table below.

SCADA Components

Component	Manufacturer	Function
Computer Operating System	Power Edge R430 8 CPUs x Intel(R) Xeon(R) Windows Server 2012 R2 Standard Inductive Automation Ignition 7.9.5 iPads (3) with industrial case for remote access	Monitors all system functions including pump controls and logic, reservoir levels, flows, system pressure (HP stations), power usage, data storage, alarms
Radios	Microwave Data Systems MDS 9310	Provides wireless communication between central telemetry and remote locations and operates within 902-928 MHz
Remote PLCs	Predominantly Allen Bradley	Process control and monitoring, remote data logging to central computer

Authorized persons can access the telemetry from the production office or from a remote location. Access to the various levels of the system is restricted based upon the following classification:

- Operators
- Data Processing
- Supervisors
- Management

Possible Recommendations

In order to protect the SCADA system, it is recommended to perform the following:

- Create a map of the overall SCADA network. All locations the system connects to the internet and internal networks, hardware, software, and employees with access should be documented. This will help identify potential access points for hacking and malware.

- Plan and schedule downtime in order to update and patch the system virtually whenever required by the City's SCADA vendor. Virtual patching helps manage vulnerabilities and prevent exploiting loopholes within the system.

- Apply network segmentation to the SCADA network. Partitioning networks can assist in preventing the spread of malware and efficiently contain attacks since networks limit access privileges to only individuals that require it.

Physical Security Measures for Assets

Physical security measures such as fencing, walls, and locked doors are imperative in preventing unauthorized access to City assets. The City has fence perimeters around all sites as well as sufficient protocol for locking facilities.

Main Line Breakages

The 2021 Risk Assessment Summary Report for the City of La Verne identifies the Miramar Water Treatment Plant (WTP) line, the PWRJF transmission line, the Wheeler BPS. and the Plateau BPS as vulnerable to terrorist attacks and earthquake damage.

The Miramar WTP transmission line is composed of 36-inch and 24-inch ACP. The City does not have 36-inch or 24-inch ACP in stock at their yard, but can obtain it from vendors if needed. Similarly, the pipe material composing the PWRJF transmission line and the mains for the Wheeler and Plateau Booster Pump Stations can be provided by vendors.

As described in the 2020 City of La Verne WMP, the City's water system has enough gravity storage and sufficient hydraulic looping within the water system to maintain operable during a line breakage. The higher elevated tanks in the water system can be used to turn the system into gravity fed temporarily. There are alternative routes to keep water flowing in the system until the City has enough time to obtain the needed materials for repair.

Appendix K – Detection Strategies

Appendix K – Detection Strategies

Strategies to detect malevolent acts or natural hazards that can threaten the security or resilience of the City are critical. Detecting incidents in a timely manner will allow the City to implement emergency strategies as soon as possible.

Detection strategies that are currently being implemented or are recommended to be put in place are discussed for the following situations:

- Power loss
- Natural hazards
- Incidents regarding chemical storage facilities
- Unauthorized access into City facilities (Physical security measures for assets)
- Cyber-attacks
- Water contamination

Detection Strategies

Category	Implemented/ Recommended to be Implemented	Detection Strategies	Reason
Existing Implemented Detection Strategies			
Power Loss	Implemented	Sign up to receive notification from power provider for any planned maintenance or brown outs.	To be prepared for any planned power loss events
Natural Hazards	Implemented	Check the weather daily in order to take note of extreme weather if necessary.	To be prepared for any extreme weather events
Routine Inspections of Chemical Storage Facilities	Implemented	Visit and inspect all hazardous chemical storage facilities and other key facilities daily.	To discover in a timely manner when there is an incident at any key facilities

Category	Implemented/ Recommended to be Implemented	Detection Strategies	Reason
Recommended to be Implemented Detection Strategies			
Physical Security Measures for Assets	Recommended	Incorporate intrusion detection systems to all doors and fence gates at all sites.	To determine if someone is trespassing into any facilities
Cybersecurity	Recommended	Sign up for alerts on the Department of Homeland Security's cyber alerts website (https://us-cert.cisa.gov/ncas/alerts).	To be informed about current security issues, vulnerabilities, and exploits
Water Contamination	Recommended	Add advanced metering infrastructure (AMI) to the system	To alert the City of potential backflow events or meter tampering

Section 1 - Introduction

Introduction

This introduction section presents the purpose, goals, plan overview, and general utility information for the City of La Verne.

Purpose

The Emergency Response Plan is intended to be a basic guide for the front-line City of La Verne water division employees dealing with the early stages of a local disaster. While this plan covers various emergencies, no single plan can address every situation encountered in the field during an emergency. All employees are expected to exercise good judgment while relying on individual experience and training. This emergency response plan should be periodically reviewed and updated to ensure its effectiveness. The intention of this plan is not to address major issues such as mutual aid, emergency operation center procedures, or post disaster clean up and finance.

This 2021 Emergency Response Plan is intended to protect the general public from imminent danger from flooding and contamination that may occur due to structural damage to water distribution and storage facilities. Additionally, this plan encompasses the conservation of the existing water supply for human consumption and fire protection. This plan considers the results of the 2021 Risk and Resilience Assessment summary.

Goals

The goals of this ERP are to:

- Minimize negative impacts on public health and employee safety.
- Provide emergency public information concerning customer service.
- Rapidly restore water service after an emergency.
- Ensure adequate water supply for fire suppression.
- Minimize water system damage.
- Minimize impact and loss to customers.

Plan Overview

The Emergency Response Plan (ERP) is organized into eleven sections and 8 appendices, as described below:

Section 1: Introduction
Section 2: Access Damage and Classify Emergency
Section 3: Water Quality Emergencies
Section 4: Implement Emergency Instructions and Communication

Section 5: Prioritize Damage to be Repaired and Determine Necessary Work
Section 6: Request Aid
Section 7: Mutual Aid Agreement and Access
Section 8: Media – Public Information
Section 9: Recovery Period

List of Appendices

Appendix A: Patrol Map
Appendix B: Information Sheets for Critical Locations and Patrol Area Condition Sheets
Appendix C: Water Quality Emergency Notification Plan 2021
Appendix D: Unsafe Water Notices
Appendix E: Amount of Chlorine per 100 Gallon Barrel
Appendix F: Chlorine Volume Required Gallons Per Day (GPD) Per mg/L or PPM of Desired Chlorine Dosage
Appendix G: CA JPIA Significant Incident Form
Appendix H: Public Works Organization Chart-Rev Apr 2021
Appendix I: Existing Water System Facilities
Appendix J: Mitigation Actions
Appendix K: Detection Strategies

Table 1-1 Abbreviations

Abbreviation	Description
ACP	Asbestos Concrete Pipe
BPS	Booster Pump Station
BWN	Boil Water Notice
CCR	California Code of Regulations
CIP	Cast Iron Pipe
City	City of La Verne
CUPA	Certified Unified Program Agency
DDW	Department of Drinking Water
DIP	Ductile Iron Pipe
DPD	N,N-diethyl-1,4-benzenediamine
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ER Lead	Emergency Response Lead
gpd	Gallons Per Day
gph	Gallons Per Hour
GSWC	Golden State Water Company

Abbreviation	Description
JPIA	Joint Powers Insurance Authority
LA	Los Angeles
MCL	Maximum Concentration Level
MG	Million Gallons
mg/L	Milligrams Per Liter
MWD	Metropolitan Water District
PLC	Programmable Logic Controllers
ppm	Parts Per Million
PVC	Poly Vinyl Chloride
PWRJF	Pomona Walnut Rowland Joint Feeder
SCADA	Supervisory Control and Data Acquisition
SEMS	Standardized Emergency Management System
SWRCB	State Water Resources Control Board
TVMWD	Three Valleys Municipal Water District
Utility	City of La Verne
UWA	Unsafe Water Alert
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compound
WMP	Water Master Plan
WTP	Water Treatment Plant

General Information about City of La Verne

The City of La Verne (City) was founded in 1887 and incorporated in 1906. It is located in the foothills of the San Gabriel – Pomona Valleys, encompassing approximately 5,478 acres (8.56 square miles). Located approximately 32 miles east of Los Angeles, it is bounded by the cities of San Dimas, Pomona, and Claremont, as well as portions of unincorporated Los Angeles County. The City provides potable water supply for domestic, irrigation, and fire protection services to all users.

La Verne City Hall
3660 D Street, La Verne, California 91750-3599
(909) 596-8741

Water System Information
Public Water System Identification Number 1910062
Distribution grade 4 level
Treatment grade 3 level

Sources of Supply

Based on the City of La Verne 2020 UWMP, there is a service area population of approximately 33,313, including residents and small businesses through varying sized water services. Groundwater to import water usage ratio is approximately 28%:72% in 2017 and has been gradually trending towards an increase of imported water.

The City currently owns nine groundwater production wells with a total capacity of 4,750 gpm as shown in Table 1-2.

Table 1-2 Groundwater Production Wells

Well Name	Capacity (gpm)
Walnut Well	450
Lincoln Well	1,000
Mills Tract	950
La Verne Heights 1	200
La Verne Heights 2	200
La Verne Heights 3	350
Beech Well	500
Amherst Well	450
Old Baldy Well	650
Total	**4,750**

The City currently has seven TVMWD import water connections with adequate supply. The locations of those import connections are shown in Table 1-3.

Table 1-3 Import Water Connections

Meter Connection	Location	Flow Rate (cfs)
6th Street and White Avenue	Lincoln Park	8
5th Street and White Avenue	5th Street and White Avenue	8
5th and C Streets	5th and C Streets	3
Williams Avenue	Baseline Road and Williams Avenue	8
Amherst Street	Williams Avenue and Amherst Street	3
Emerald Avenue	Baseline Road and Emerald Avenue	6
Wheeler Avenue	Baseline Road and Wheeler Avenue	6
Total		**42**

Maintenance

District staff performs maintenance on the entire system routinely. Certified operators are responsible for pump and motor maintenance, and leak and valve repair. Projects outside of the limits for routine maintenance are to be contracted with private contractors.

Facilities

Within the City of La Verne's water system, there is approximately:

- 132 miles of transmission and distribution mains in the system (diameters ranging from 2-inchs to 24-inches with various pipeline materials are used, including ACP, CIP, DIP, and PVC)
- Total of 11 reservoirs, with a total storage capacity of 27 MG
- 10 booster pump stations with a maximum pumping capacity of approximately 23,720 gpm
- One hydropneumatics pump station in the system with a total pumping capacity of 3,280 gpm

See Appendix I for existing water facilities within the City of La Verne.

Telemetry

A Supervisory Control and Data Acquisition (SCADA) system was installed in 1996 and upgraded in 2006 with new software and hardware. New programmable logic controllers (PLC) were deployed at all remote locations throughout 2007 and 2009. Another upgrade occurred in 2014 and moved to the cloud using the Works Mission Critical Ignition (Inductive Automation) software program.

Critical functions of the production system, excluding valve control, can be controlled and monitored from the central computer servers. SCADA controls many things in the system including:

- well and pump control
- reservoir level
- data management tasks
- the monitoring of well and pump run times/status
- well and pump energy use
- reservoir levels
- hydropneumatics system pressure
- remote communications status
- flow from all TVMWD and City meters

Chemical Handling and Storage Facilities

Chemicals released during accidental releases, earthquakes, or other emergencies may impact water distribution facilities. It is important to understand what chemicals are contained within the City to determine how they can impact the water system.

The Los Angeles Fire Department Certified Unified Program Agency (CUPA) has records of chemical material storage locations within LA County. The CalEPA Regulated Site Portal has an interactive map that contains data regarding environmental regulated facilities within LA County. This site can be accessed at the URL below:

https://siteportal.calepa.ca.gov/nsite/map/help

The data from this map was extracted to show facilities containing chemical material storage within the City of La Verne. Table 1-4 summarizes the potential hazards that are within the city. Addresses shown are all within the City of La Verne (ZIP code 91750).

Table 1-4 Chemical Material Storage Locations within the City of La Verne

Facility Name	Address	Chemical Name	Common Name
2832 Vons A Safeway Company	1600 FOOTHILL BLVD	Helium	Helium
		R-507	Freon
		Retail Hazardous Waste	Retail Hazardous Waste
7-ELEVEN INC. STORE #13942	3720 TOWNE CENTER DR	CARBON DIOXIDE	CARBON DIOXIDE, REFRIGERATED LIQUID
		PROPANE	PROPANE
99 Cents Only Stores #246	1504 FOOTHILL BLVD	Helium	Helium
		Waste 123 - Unspecified Alkaline	Corrosive Wastes
		Waste 131	Oxidizer Wastes
		Waste 135 - Misc Toxic Waste	Toxic Wastes
		Waste 214 - Flammable Liquid	Flammable Wastes
		Waste 352 - Non Empty Aerosols	Aerosol Wastes
Aldi #13	2268 FOOTHILL BLVD	-	Aerosol Waste
		-	Alkaline Waste
		-	Flammable/Combustible Waste
		-	Lead Acid Batteries
		-	Oily Waste
		-	Over the Counter Drug Waste
		-	Oxidizing Waste
		-	Poisonous Waste
		-	Universal Waste

Facility Name	Address	Chemical Name	Common Name
		Carbon Dioxide	Carbon Dioxide
AT&T Mobility - LAVERNE (USID12365)	1507 HOLLY OAK ST	Lead Acid Batteries	Lead Acid Batteries
AutoZone #5398	1410 FOOTHILL BLVD	-	Lead Acid Batteries Containing Sulfuric Acid
		-	Spent Lead Acid Batteries Containing Sulfuric Acid
		ETHYLENE GLYCOL	ETHYLENE GLYCOL
		METHYL ALCOHOL	METHYL ALCOHOL
		Misc Alkaline Products	Damaged Non-Saleable Retail Alkaline Products
		Misc Corrosive Products	Damaged Non-Saleable Corrosive Retail products
		Misc Flammable Aerosol Products	Damaged Non-Saleable Flammable Aerosol Retail Products
		Misc Flammable Products	Damaged Non-Saleable Flammable Retail Products
		Misc Non-RCRA Regulated Products	Damaged Non-Saleable Non-RCRA Retail Products
		Misc Reactive Products	Damaged Non-Saleable Reactive Retail Products
		Used Motor Oil	Used Motor Oil
		Used Soda Ash	Used Soda Ash
		WASTE ABSORBENT	WASTE ABSORBENT
BONITA HIGH SCHOOL	3102 D ST	-	Animal Specimens
		-	Waste - Animal Specimens
		-	Waste - Antifreeze/Coolant
		-	Waste - Cooking Oil
		-	Waste - Motor Oil
		-	Waste - Oil Filters
		-	Helium
CHILI'S GRILL & BAR	1912 FOOTHILL BLVD	CARBON DIOXIDE	CARBONIC ACID GAS
Chipotle Mexican Grill #1551	2298 FOOTHILL BLVD	Carbon Dioxide, Liquid	Carbon Dioxide, Liquid
CITY OF LA VERNE (MAINT YARD)	2620 1ST ST	-	ANTIFREEZE ETHYLENE GLYCOL
		-	AUTOMATIC TRANSMISSION FLUID
		-	GEAR LUBE
		-	HYDRAULIC OIL
		-	MOTOR OIL
		-	ANTIFREEZE ETHYLENE GLYCOL
		ACETYLENE	ACETYLENE
		Argon Compressed	Argon Compressed
		Argon, mixed with helium	Alumix shieling gas

Facility Name	Address	Chemical Name	Common Name
		Carbon Dioxide	Carbon Dioxide
CITY OF LA VERNE (MAINT YARD)	2620 1ST ST	DIESEL FUEL NO. 2	DIESEL FUEL
CITY OF LA VERNE (MAINT YARD)	2620 1ST ST	GASOLINE	GASOLINE
		Helium	Helium
		Non-rcra Hazardous Waste Liquid (waste Oil)	WASTE OIL
		OXYGEN	OXYGEN
		PROPANE	PROPANE
CITY OF LA VERNE PUBLIC SAFETY FACI	2061 3RD ST	Fuel oil, no. 2	Fuel oil no. 2
		Oxygen	Oxygen
Crown Lift Trucks - City of Industry Branch	1300 PALOMARES ST	-	Lead Acid Batteries
		-	Used Oil Filters (Drained)
		-	Waste Aerosols
		Acetylene	Acetylene
		Argon, isotope of mass 37	Argon-37
		Ethylene Glycol	Ethylene Glycol
		Lubricating oils, used	Used lubricating oils
		Nitrogen	Nitrogen
		Oxygen	Oxygen
		Propane	Liquefied Petroleum Gas (lpg)
D STREET SHELL	1947 D ST	-	Waste Absorbent / Rags
		-	Waste Water Containing Gasoline
		Carbon Dioxide	Carbon Dioxide
		Liquefied Petroleum Gas	Propane
		Petroleum Hydrocarbon	Diesel Fuel #2
		Petroleum Hydrocarbon	Premium Unleaded Gasoline
		Petroleum Hydrocarbon	Regular Unleaded Gasoline
Direct Connection	1538 ARROW HWY	HYPLUS EC PROCESS SERIES INK	OFFSET PRINTING INK
		KODAK 980 PLATE DEVELOPER	DEVELOPER
		PLATE FINISHER 850S/4S/C	GUM
		waste ink	waste ink
		waste ink contaminated solids	waste ink contaminated solids
		ZETA WASH	Blanket & Roller Wash
Direct Edge	1480 ARROW HWY	Acetylene	Acetylene
		AR/CO2	AR/CO2
		Propane	Propane
		USED OIL	USED OIL
Dollar Tree #05257	1475 FOOTHILL BLVD	Helium	Helium
DPI LABS INC	1350 ARROW HWY	Non RCRA Hazardous waste, liquid (oily water)	Non RCRA Hazardous waste, liquid (oily water)
DYNAMIC AUTOMOTIVE	2048 ARROW HWY	-	automatic transmission fluid

Facility Name	Address	Chemical Name	Common Name
		-	coolant
DYNAMIC AUTOMOTIVE	2048 ARROW HWY	-	motor oil
		Non-rcra Hazardous Waste Liquid (waste Oil)	WASTE OIL
El Pollo Loco #5379	2360 FOOTHILL BLVD	Carbon Dioxide, Liquid	Carbon Dioxide, Liquid
EMERALD CLEANERS	3836 EMERALD AVE # J	hydrocarbon	HYDROCARBON
		Hydrocarbons	Waste Hydrocarbons
Expression In Wood	1730 ARROW HWY	-	PROPANE
		-	WATER BASED PAINT
		SOLVENT BASED PAINT	SOLVENT BASED PAINT
		WASTE PAINT FILTERS	WASTE PAINT FILTERS
		WASTE PAINT SOLID	WASTE PAINT SOLID
Frontier California: La Verne CO	2158 3RD ST	-	LEAD ACID BATTERY
		BROMOTRIFLUOROMETHANE	HALON 1301
		DIESEL FUEL #2	DIESEL FUEL #2
		Diesel Fuel No. 2	Diesel Fuel No. 2
		Nitrogen	Nitrogen
Gilead La Verne	1800 WHEELER AVE	-	Argon and Methane Gas Mixture
		-	Argon and Methane Gas Mixture
		-	Chloroform/Methanol
		-	Clean-Up Wipes
		-	Gentron R 507 Freon
		-	Non-RCRA Hazardous Waste Solid
		-	Non-RCRA Liquid Drug
		-	Organic Solvents
		-	Room Cleaning Debris
		-	Room Cleaning Solution Acid
		Air	Air
		Argon	Argon
		Diesel Fuel No. 2	Diesel Fuel No. 2
		Helium	Helium
		Hydrogen	Hydrogen
		Liquefied Petroleum Gases	Liquified Petroleum Gas
		Methanol	Methyl Alcohol
		Nitrogen	Nitrogen
		Nitrogen, Liquid	Nitrogen, Liquid
		Nitrogen, Liquid	Nitrogen, Liquid Tank 1
		Nitrogen, Liquid	Nitrogen, Liquid Tank 2
		Trichloromethane	Chloroform
		Trichloromethane	Chloroform
IN-N-OUT BURGER INC	2098 FOOTHILL BLVD	CARBON DIOXIDE	CO-2
Jack in the Box #5432	1090 FOOTHILL BLVD	Carbon Dioxide	Carbon Dioxide

Facility Name	Address	Chemical Name	Common Name
La Verne Auto Center	2171 3RD ST	-	Motor Oil
La Verne Auto Center	2171 3RD ST	-	Used Oil Filters (Drained)
		USED COOLANT	USED COOLANT
		USED OIL	USED OIL
LA VERNE CAR WASH	914 FOOTHILL BLVD	Aliphatic Petroleum	Tire Dressing
LA VERNE CAR WASH	914 FOOTHILL BLVD	ATF	Multi-Vehicle ATF
		Carbon Dioxide	Liquid CO2
		Ethylene Glycol	Antifreeze/Coolant
		Gasoline	Gasoline
		Lubricating OIl	Motor Oil
		Sodium Hydroxide 0.5-10%	All Purpose Cleaner
		Waste Ethylene Glycol	Waste Ethylene Glycol
		Waste OIl	Waste OIl
LA VERNE CLEANERS	2084 FOOTHILL BLVD # A	Cyclopentasiloxane, 2,2,4,4,6,6,8,8,10,10-decamethyl-	Waste Green Earth
		Decamethylcyclopentasiloxane	Green Earth
		Filter debris (containing cyclosiloxane)	Filter debris (containing cyclosiloxane)
La Verne Shell	2510 E FOOTHILL BLVD	-	Liquid Waste - Water/Gasoline Mixture
		-	Ryko Foam Detergent
		-	Ryko Wax Luster
		-	Premium Unleaded Gasoline
		-	Regular Unleaded Gasoline
		Carbon Dioxide	Carbon Dioxide
		Diesel Fuel No. 2	Diesel Fuel No. 2
		Propane	Propane
LA VERNE TOWNE CENTER CLEANERS	2445 FOOTHILL BLVD # B	Isoparaffinic Hydrocarbon	DF-2000 FLUID
LA VERNE-FIRE STATION #3	5100 ESPERANZA DR	PETROLEUM DISTILLATE	#2 DIESEL FUEL
McDonald's of La Verne #4729	2269 FOOTHILL BLVD	Carbon Dioxide	Carbon Dioxide
MOHAWK WESTERN PLASTICS	1496 ARROW HWY	Ethene, homopolymer	Polyethylene
		Lubricating oils, used	Used lubricating oils
		PROPANE	PROPANE
MWD - LIVE OAK RESERVOIR	2901 GAMBREL GATE	Diesel Fuel No. 2	*Diesel Fuel
		DIESEL FUEL NO. 2	DIESEL FUEL
		SODIUM THIOSULFATE	*SODIUM THIOSULFATE CRYSTAL
MWD - Weymouth Water Treatment Plant	700 MORENO AVE	*AQUA AMMONIA 19%	*AQUA AMMONIA
		Acetic Acid	Acetic Acid (Acetate Buffer) Solution

Facility Name	Address	Chemical Name	Common Name
MWD - Weymouth Water Treatment Plant	700 MORENO AVE	ACETIC ACID	ACETIC ACID SOLUTION ACETATE BUFFER SOLUTION
		ACETYLENE	ACETYLENE
		ALIPHATIC POLYISOCYANATE	AMERSHIELD ALIPHATIC POLYURETHANE AMERSH CURE
		ALKYD RESIN	ALKYD RESIN
		Aluminum Sulfate	*Aluminum Sulfate
		ALUMINUM SULFATE	*ALUMINUM SULFATE
		ALUMINUM SULFATE	ALUMINUM SULFATE
		AQUA AMMONIA 19%	*AQUA AMMONIA
		AQUA AMMONIA 19%	AQUA AMMONIA
		ARGON	ARGON
		ARGON COMPRESSED	ARGON COMPRESSED
		Automatic Transmission Fluid (ATF)	Automatic Transmission Fluid (ATF)
		BATTERIES	USED BATTERIES (LEAD/ACID)
		Bromotrifluoromethane	Halon 1301, Bromotrifluoromethane
		CALCIUM HYPOCHLORITE MIXTURE	DRY BLEACH (HTH)
		CARBON DIOXIDE	CARBON DIOXIDE
		Cationic Polymer	*Polymer, Liquid Poly DADMAC, Magnafloc
		CHLORINE	*CHLORINE
		Chlorodifluoromethane (Refrigerant)	Freon 22 (Chlorodifluoromethane)
		Compressed Air	Compressed Air
		COPPER SULFATE PENTAHYDRATE	COPPER SULFATE
		Dichlorodifluoromethane	R-12, Dichlorodifluoromethane
		Diesel Fuel No. 2	*Diesel Fuel No. 2
		Diesel Fuel No. 2	Diesel Fuel No. 2
		EPOXY RESIN	RESIN
		EPOXY RESINS	RESINS AND CURING COMPOUNDS (VARIOUS)
		FLUOROSILICIC ACID (23%)	*FLUOROSILICIC ACID (FSA)
		FLUOROSILICIC ACID (23%)	WASTE FLUOROSILICIC ACID (FSA) SOLUTION
		Gasoline	*Gasoline (Unleaded)
		HELIUM	HELIUM
		HYDRAULIC OIL	HYDRAULIC OIL
		Hydrogen Peroxide	*Hydrogen Peroxide 35%
		HYDROGEN-ARGON MIX	HYDROGEN-ARGON MIX

Facility Name	Address	Chemical Name	Common Name
MWD - Weymouth Water Treatment Plant	700 MORENO AVE	K-TRI-MIX (ARGON, CO2, HELIUM)	K-TRI-MIX (ARGON, CO2, HELIUM)
		Lead Acid Batteries	Lead Acid Batteries
		LIQUID OXYGEN	*LIQUID OXYGEN (LOX)
		Lube Oil	Lube Oil
		MOBIL VACTRA OIL NO. 2	MOBIL VACTRA OIL NO. 2
		MOBIL VACTRA OIL NO. 4	MOBIL VACTRA OIL NO. 4
		MOBIL VELOCITE OIL NO. 6 - SOLVENT DEWAXED LIGHT PARAFFIN	MOBIL VELOCITE OIL NO. 6
		MOTOR OIL	SUPER DELUXE CORONATION MOTOR OIL - ALL GRADES
		Motor Oil, Waste	WASTE MOTOR OILS
		MOTOR OILS - VARIOUS WEIGHTS	MOTOR OILS
		Motor Oils- various weights	MOTOR OILS
		MULTI-PURPOSE GEAR OIL- ALL GRADES	MULTI-PURPOSE GEAR OIL- ALL GRADES
		NITROGEN	NITROGEN
		NITROGEN (GAS)	NITROGEN (GAS)
		OXYGEN	OXYGEN
		PAINTINGS AND COATINGS (VARIOUS)	AMERCOAT ZINC RICH EPOXY 68HS PART A B C (115955)
		PAINTS AND COATINGS (VARIOUS)	PAINT AND COATINGS (VARIOUS)
		PAINTS AND COATINGS (VARIOUS)	PAINTS AND COATINGS (VARIOUS)
		PETROLEUM HYDROCARBON - DIESEL FUEL	*DIESEL FUEL
		PETROLEUM HYDROCARBON - INSULATING OIL	TRANSFORMER INSULATING OIL 10CA/SPEC A13A3A1 INHIB
		Polyacrylamide	Polymer
		PROPANE	LIQUEFIED PETROLEUM GAS (LPG)
		PROPANE	PROPANE
		Propane, 1,1,1,2,3,3,3-heptafluoro-	HFC-125, FE 227, FM 200 (Fire Extinguishing Agents)
		Propane, 1,1,1,2,3,3,3-heptafluoro-	HFC-227, FM 200, HFC 125 (Fire Extinguishing Agent)
		SODIUM HYDROXIDE (25 TO 50%)	*SODIUM HYDROXIDE
		Sodium Hydroxide 20%	*Sodium Hydroxide 20%
		Sodium Hypochlorite 5.25%	*Sodium Hypochlorite (Bleach 5.25%)

Facility Name	Address	Chemical Name	Common Name
MWD - Weymouth Water Treatment Plant	700 MORENO AVE	SODIUM THIOSULFATE	*SODIUM THIOSULFATE CRYSTAL
		SOLVENT MIXTURE	LACQUER THINNER
		SULFURIC ACID (93%)	*SULFURIC ACID (93%)
		Transformer Oil	Transformer Insulating Oil
		Turbine Oil	Turbine Oil
		WASTE ALUMINUM SULFATE	WASTE ALUMINUM SULFATE
		WASTE Ammonium Hydroxide	WASTE AQUA AMMONIA
		WASTE AQUA AMMONIA	WASTE AQUA AMMONIA
		Waste Cationic Polymer	Waste Polymer, Liquid Poly DADMAC, Magnafloc
		WASTE EPOXY RESINS/ADHESIVE	WASTE EPOXY RESINS/ADHESIVE
		Waste Ethylene Glycol	Waste Antifreeze (Ethylene Glycol)
		Waste Ethylene Glycol	Waste Antifreeze (Ethylene Glycol)
		Waste Gasoline and Water	Waste Gasoline and Water
		WASTE LEAD CONTAINING MATERIAL	WASTE LEAD CONTAINING MATERIAL
		WASTE NITRIC ACID	WASTE NITRIC ACID (TRACES IN WATER)
		Waste Oil and Absorbent	Waste Oil and Absorbent
		Waste Oil Filters	Waste Oil Filters
		WASTE PAINT ENAMELS	WASTE PAINT ENAMELS
		Waste Paint Related Debris	Waste Paint Related Debris
		Waste Sandblast Material	Waste Sandblast Material
		Waste Sodium Hydroxide	Waste Sodium Hydroxide
		WASTE SODIUM HYPOCHLORITE (12.25%)	WASTE SODIUM HYPOCHLORITE (12.25%)
		WASTE SULFURIC ACID (93%)	WASTE SULFURIC ACID (93%)
		Waste Transformer Oil (non-PCB)	Waste Transformer Oil (non-PCB)
		Welding Gas	Welding Gas (Argon and Carbon Dioxide)
		WELDING GAS (ARGON 90% - CARBON DIOXIDE 10%)	WEDLDING GAS (ARGON 90% -CARBON DIOXIDE 10%)
Pacific Precision, Inc.	1318 PALOMARES ST	-	Cutting Oil
		-	Cleaning solvent
		-	Waste Cutting Oil
Pacific Precision, Inc.	1318 PALOMARES ST	1,2-propanediol	1,2-propanediol
		Acetone	Acetone
Precision Machine Work Inc	1455 PALOMARES ST STE A	Acetone	Acetone

Facility Name	Address	Chemical Name	Common Name
Precision Machine Work Inc	1455 PALOMARES ST STE A	Butyl Acetate	Butyl Acetate - paint waste
		Cutting Oil	Cutting Oil
		Ethylene Glycol	used lubricant oil
		Hydraulic Oil	Hydraulic Oil
REGAL ENTERTAINMENT GROUP-EDWARDS L	1950 FOOTHILL BLVD	CARBON DIOXIDE	CARBON DIOXIDE
Rubio's Restaurants Inc. Store 76	2204 FOOTHILL BLVD	Carbon Dioxide	Carbon Dioxide
SANTANA CYCLES INC	1324 ARROW HWY	-	LATEX PAINTS WASTE
SANTANA CYCLES INC	1324 ARROW HWY	-	NON RCRA HAZARDOUS LATEX PAINT BOOTH FILTER WASTE
		ACETYLENE	ACETYLENE
		ARGON	ARGON
		Nitrogen	Nitrogen Gas
		OXYGEN	OXYGEN
SCE Weymouth Substation	700 MORENO AVE	Petroleum Distillates (Hydrotreated Light Naphthenic)	Mineral Oil
		Sulfur Hexafluoride	SF6 Gas
Sprouts Farmers Market #418	1375 FOOTHILL BLVD	R-407A	R-407A
Stater Bros. Markets 048	2090 FOOTHILL BLVD	-	R-404A
		1,1,1,2-TETRAFLUOROETHANE	R-134A, HCF-134A
		Chlorodifluoromethane	R-22, HCFC-22
T-Mobile West, LLC IE04688A	1431 FOOTHILL BLVD	Electrolyte/sulfuric Acid	Lead Acid Battery
		Propane	Liquefied Petroleum Gas (lpg)
TACONIC	1400 ARROW HWY	2-Butanone	Methyl Ethyl Ketone
		ACETONE	ACETONE
		Bismaleimide Triazine Resin	BT RESIN (BT 2110)
		Mixed Resin	Mixed Resin
		Tetraglycidyl Ether of Tetraphenol Ethane	EPON RESIN 1031-A-70
		TOLUENE	TOLUENE
		Used Hydraulic Oil	Used Hydraulic Oil
TARGET T0226	2462 FOOTHILL BLVD	Aerosol Retail Waste	Aerosol Retail Waste
		Carbon Dioxide	Carbon Dioxide
		Corrosive Acids Retail Waste	Corrosive Acids Retail Waste
		Corrosive Bases Retail Waste	Corrosive Bases Retail Waste
		Flammable\Toxic Retail Waste	Flammable/Toxic Retail Waste
TARGET T0226	2462 FOOTHILL BLVD	Hydraulic Fluid	Hydraulic Fluid
		Oxidizer Retail Waste	Oxidizer Retail Waste
		Propane	Propane

Facility Name	Address	Chemical Name	Common Name
TARGET T0226	2462 FOOTHILL BLVD	R-404a	Refrigerant R-404a
		Signature UHS Floor Finish	Signature UHS Floor Finish
		State Regulated Retail Waste (Non-RCRA, CA Haz. Waste)	State Regulated Retail Waste (Non-RCRA, CA Haz. Waste)
THE ENGINE ROOM	1808 W ARROW HWY	-	AUTOMOTIC TRANSMISSION
		ETHYLENE GLYCOL	WASTE COOLANT
		Motor Oil	MOTOR OIL
		Non-rcra Hazardous Waste Liquid (waste Oil)	WASTE OIL
TLC Auto Service	1932 ARROW HWY	-	Motor Oil
		-	TRANSMISSION FLUID
		-	Used Oil Filters (Drained)
		USED OIL	USED OIL
		WASTE COOLANT	WASTE COOLANT
TRIUMVIRATE ENVIRONMENTAL SERVICES INC	2386 W 1ST ST	Propane	Propane
		Waste Oily Debris	Waste Oily Rags, Debris, Used PPE
United Pacific 0648	1120 E FOOTHILL BLVD	DIESEL FUEL No.2	DIESEL FUEL No.2
		MIDGRADE UNLEADED	MIDGRADE UNLEADED
		PREMIUM UNLEADED	PREMIUM UNLEADED
		REGULAR UNLEADED	REGULAR UNLEADED
		SOLID WASTE AFFECTED by FUEL	SOLID WASTE AFFECTED by FUEL
		WATER & FUEL WASTE	WATER & FUEL WASTE
Verizon Wireless: La Verne	2280 DAMIEN AVE	Diesel Fuel No. 2	Diesel Fuel No. 2
		Lead Acid Batteries	Lead Acid Batteries
VONS FUEL CENTER #2832	1604 E FOOTHILL BLVD	Diesel	Diesel
		Petroleum Hydrocarbon	Gasoline Unleaded
WHEELER CLEANERS	1405 FOOTHILL BLVD # A	-	DF-2000 FLUID

Mitigation Actions

Mitigation actions are steps that can be taken to obviate or significantly lessen the impact of a malevolent act or natural hazard effecting the supply of drinking water provided to the community.

Mitigation strategies that are currently being implemented or are recommended to be put in place are discussed for the following situations:

- Alternative source water options for when system is unable to supply customers fully (Import water and emergency interconnections)
- The loss of power (with regard to active booster and hydropneumatic stations and SCADA)

- SCADA system intrusion
- Unauthorized access into City facilities (Physical security measures for assets)
- Main line breakages

The mitigation actions for these situations can be found in Appendix J.

Detection Strategies

Detection strategies are used to discover any hazards or malevolent acts that can threaten the City's normal operations.

Recommended detection strategies or ones already in place are discussed for the following situations:

- Power loss
- Unauthorized access into City facilities (Physical security measures for assets)
- Incidents regarding chemical storage facilities
- Natural hazards
- Cyber-attacks
- Water contamination

The detection strategies for these situations can be found in Appendix K.

Section 2 - Assess Damage and Classify Emergency

Initial Response

The initial response is the immediate action that should be taken at the start of an emergency situation.

Once it is recognized that an incident is occurring, the person or people who have noticed should determine if response by the fire department, police, or emergency medical services are needed. If this is the case, 911 should be called to report the situation.

After calling 911, the Director of Public Works and the State Water Resources Control Board (SWRCB) Department of Drinking Water (DDW) should be contacted. Following this, staff assigned to specific emergency tasks and per their emergency response roles shall perform those tasks as their highest priority.

Preliminary Damage Assessment

After the initial response should follow an assessment of damage. Damage assessment is crucial to estimating the amount of repair and allocating the resources needed to return the system to normal operations.

Preliminary damage assessment is as follows:

- Determine need to repair, replace, or abandon facility
- Consider possible effects of aftershocks
- Evacuate buildings in danger of collapse
- Confirm that field crew makes assessment of facilities and distribution system

Patrol Distribution System

Patrolling the distribution system after an emergency incident will allow the City to properly assess damage and prepare for recovery.

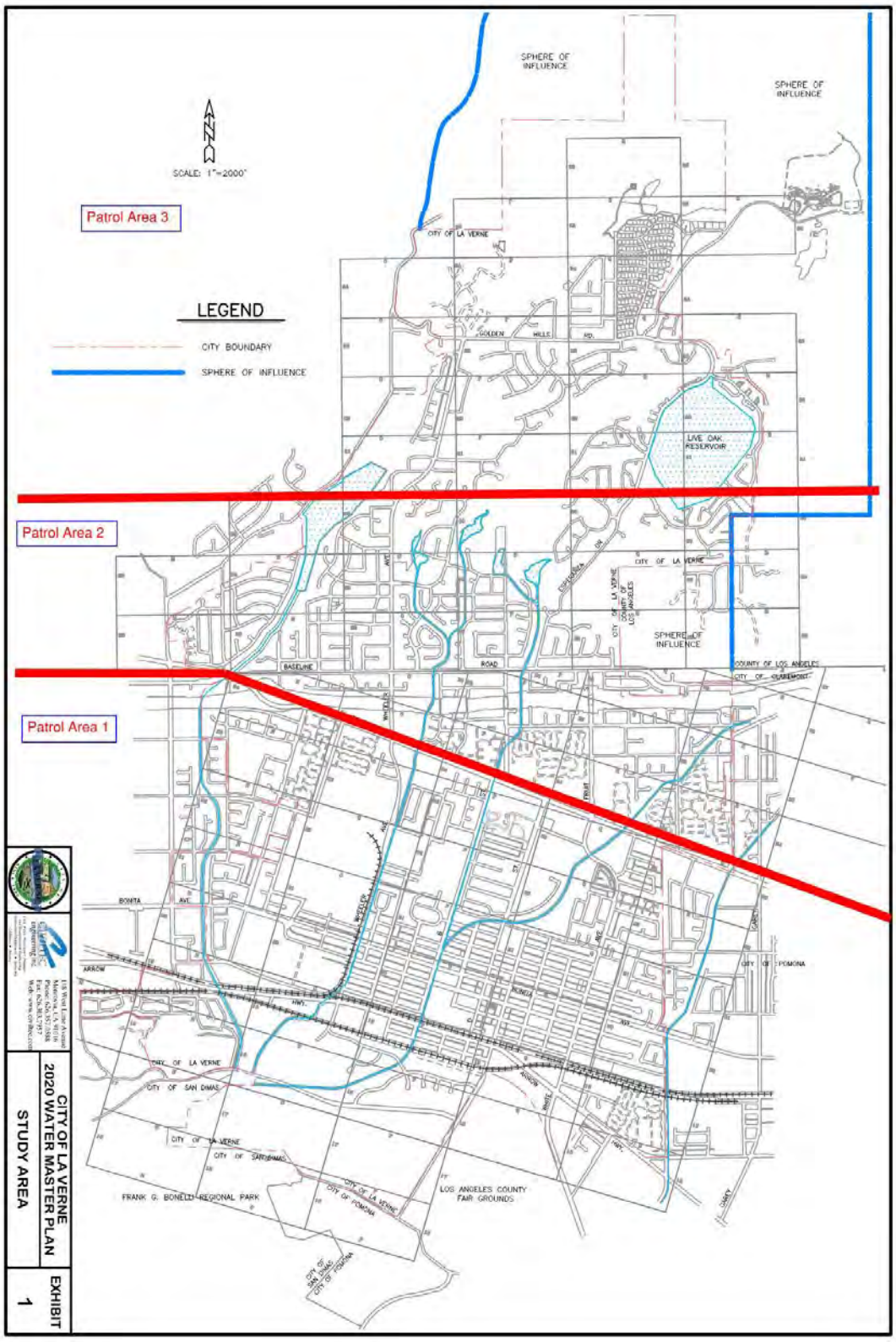
Patrolling the area is a critical part of finding issues with the distribution system.

- **Patrol Area 1** is bounded by the southern border of the City of La Verne and Foothill Blvd.
- **Patrol Area 2** is located between Foothill Blvd and Oak Mesa Drive.
- **Patrol Area 3** is bounded by Oak Mesa Drive and the northern border of the City of La Verne.

The following steps should be followed during this phase:

- Patrol assigned area. Coordinate three different patrol groups and refer to map located in Figure 2-1 or Appendix A to see which area your group is assigned to patrol.
- During patrol, check distribution system for leaks, breaks, water or sewage flowing into streets or flood control channels.
- Check for pressure loss in lines
- Record location and conditions and turn in to the Emergency Operations Center (EOC) (The information sheets that are to be filled out for critical locations and the Patrol Area Condition sheets are located in Appendix B)
- Tag any damaged facilities and equipment

Figure 2-1 City of La Verne Patrol Map



Classifications of Emergency

The determination of the level of emergency is needed in order to determine what set of actions should be taken next. The level of emergency will be decided by the Director of Public Works.

Classifications of Level #3 or #4 require the use of the Standardized Emergency Management System (SEMS). Documentation of Utility status must be forwarded to the LA County Emergency Operations Center (EOC). The Director of Public Works will write and forward this information.

LA County EOC Contact:
(323) 980-2200
1275 N. Eastern Ave, Los Angeles, CA 90063

The levels of emergency are described below:

Level No.1 – Normal Trouble

- Personnel of utility can handle problem easily
- Examples: break in individual main or individual pumping station off line

Level No.2 – Alert (Minor Emergency)

- Personnel of Utility can handle problem, but may require personnel to be put on alert, be rerouted to other than their normal work or work additional shifts
- Examples: break in several mains, more than one pumping station off line, or source water problem

Level No.3 –Major Emergency

- Problems somewhat beyond capability of Utility and may require declaration of emergency to authorize shortcut procedures
- Requires working employees additional shifts and receiving additional assistance, either mutual aid or contracts
- Examples: serious threats to reservoir, or treatment plant; power loss to pumping systems; unsafe water supply in system; breaks in major trunk lines; flowers of untreated sewage at several locations; or loss of water supply within service area

Level No.4 – Disaster

- Problems clearly and immediately beyond capability of Utility
- Recovery time will exceed one week, cost will be great, large amounts of mutual aid or contracts will be required, extended shifts will be needed for at least one week, and request for declaration of emergency will be required
- Examples: earthquakes of magnitude 6.0 or greater originating within or affecting the service area, earthquake of magnitude 7.5 or greater within 50 miles of service area, loss of at least 50 percent of water supply, import capacity, untreated sewage flowing in many street locations, loss of ability to biologically protect water supply, or outbreak of waterborne diseases

Section 3 - Water Quality Emergencies

In the case of a water quality emergency, the City can receive chlorinated water from other public water systems through imported connections or emergency connections. In the event of a disaster, it is possible to maintain chlorine residuals in all five pressure zones by taking water from TVMWD with the assistance of system booster pumps.

The TVMWD Treatment Plant receives imported water from MWD and typically produces an effluent chlorine residual of 2.5 to 3 PPM. The City's distribution system maintains a free chlorine residual ranging from 0.3 to 2.5 PPM. Residual chlorine analysis is performed daily at various locations throughout the system.

Daily chlorination in the City is achieved with on line chlorine generators located at:

- The Forebay at 6th and White Avenue
- Amherst Treatment Facility
- The Plateau Forebay site
- The Wheeler Reservoir site (only once permits are processed - they are still in the processing phase as of November 2021)

These systems have multiple days of sodium hypochlorite storage at each of these sites. All actions and residuals are logged daily. During an emergency, chlorinating equipment will be adjusted to provide 2 ppm free chlorine residual and monitored to determine the effects.

If these connections or current chlorinating equipment are not available, an emergency chlorination plan can be implemented.

Water Quality Sampling

Water quality sampling is conducted in accordance with the Title 22 of the California Code of Regulations (CCR) and the State of California Department of Health Services' requirements. The bacteria samples from the distribution system are collected and analyzed by E.S. Babcock & Sons Inc. (Babcock Laboratories) every Wednesday. All produced samples from the well are taken by qualified District personnel and forwarded to Babcock Laboratories. Results are tabulated and forwarded to the State Department of Health Services on or before the 10th of each month.

Water Quality Mitigation and Notification Procedure

Samples of all groundwater wells are taken directly at the well discharge prior to chlorinating. Samples are tested for bacteria at each well and for volatile organic compounds (VOCs) at the Lincoln, Mills Tract, and Walnut Well sites. Laboratory

personnel will contact the City staff if the maximum concentration level (MCL) of a contaminant is exceeded.

Per Section 64421 ET seq. of the Title 22 CCR, if the City experiences a positive bacteria sample within the distribution system (a fecal coliform is present), the State Department of Health Services must be notified within 24 hours.

Samples shall be retaken within 24 hours in three locations:

1. At the site of the bad sample,
2. At the nearest service connection upstream, and
3. At the next service connection downstream.

If a well sample is found to be the source of the suspected positive results, this well shall be taken off line until the results are returned as negative. If the specific positive results were taken from a well site that is not actually pumping water to the system, no Health Department notification is required.

Notification

Certified operators maintain and operate all of the City's facilities. An operator can be reached at any of the following contacts in Table 1-4.

Table 3-1 Certified Operator Contacts

Contacts	Telephone
City of La Verne	(909) 596-8741
Dispatch Police	(909) 596-1913
Production Standby (24 hours)	(909) 745-0795

Water Quality Emergency Notification Plan 2021

Public notification could be necessary during an emergency incident regarding water quality. The three types of public notifications related to water quality are:

1. a Boil Water Notice (BWN)
2. an Unsafe Water Alert (UWA)/Do Not Drink Notice
3. a Do Not Use notice

Public notification templates have been prepared in the case of any of the three types of incidents. These three types of emergencies are described in detail further in Section 3 under "Public Notification" of this emergency response plan.

During regular working hours, the Director of Public Works or a City Manager will contact the news media to broadcast the necessary warnings. The television stations

KCBS, KNBC, and KABC and the newspaper the Daily Bulletin should be contacted at these phone numbers:

- KCBS – News at (818) 655-2000
- KNBC – News at (818) 684-4321
- KABC – Eyewitness News at (818) 863-7777
- the Daily Bulletin at (909) 987-6397

The warnings will be issued in both English and Spanish. Outlying areas of the water service area will also be notified by sound truck and/or handbill distributed to their respective areas. A special telephone answering service or (reverse 911) can also be quickly set up at City Hall to answer questions from consumers.

It's anticipated that the time for notification to the television and radio audiences will be very short. The areas served by handbill and sound truck will also be notified within 4 hours.

For notification to be issued in other than normal hours, the same media will be contacted, and an announcement will be scheduled for as long as is needed.

A sound truck will be used in the early morning hours to quickly alert people not listening to their radio or television.

The 2021 version of the Water Quality Emergency Notification Plan can be found in **Appendix C**.

Water Quality Emergency Notification Plan Contacts

The following staff of the City have been designated to implement the plan upon notification by the State Department of Health Services when an imminent danger to the health of the water users exists:

Table 3-2 City Staff – Water Quality Public Notification Plan

Name	Title	Email	Day Telephone	Evening Telephone	Cell
Shawn Igoe	Director of Public Works	sigoe@cityoflaverne.org	(909) 596-8741	(626) 831-4938	(626) 831-4938
Richard J. Martinez	Utilities Manager	rjmartinez@cityoflaverne.org	(909) 596-8741	(909) 730-3504	(909) 730-3504
Ryan Ciotti	Water Production Supervisor	rciotti@cityoflaverne.org	(909) 596-8741	(909) 908-0589	(909) 908-0589

The following personnel of the State DDW and County Health Department Services in Table 3-3 will assist in carrying out the plan as well. Contact personnel in the

order shown in the table with "1" being the first to be contacted. If "1" cannot be contacted, contact "2" and so forth.

Table 3-3 State Health Department Service Staff – Water Quality Public Notification Plan

Order of Contact	Name	Title	Organization	Day Telephone	Night Telephone
1	Chi Diep, P.E.	District Engineer	SWRCB, DDW	(818) 551-2016 (818) 551-2054 (FAX)	(213) 309-3822
2	Juan Arriola, P.E.	Associate Sanitary Engineer	SWRCB, DDW	(818) 551-2034	(310) 963-9644
	Meisam Hajimorad	Water Resource Control Engineer		(818) 551-3039	(515) 520-7390
	Natalie Melgoza	Water Resource Control Engineer		(818) 551-2035	(626) 244-4676
	Thomas Tsui, P.E.	Associate Sanitary Engineer		(818) 551-2036	(626) 757-4262
	Karen Wong, P.E.	Associate Sanitary Engineer		(818) 551-2037	(626) 833-3828
3	Maurice Pantoja	Branch Director	LA County DPH-Environmental Health Environmental Protection Branch-Local Primacy 5050 Commerce Dr Baldwin Park, CA 91706	(626) 430-9438	(213) 270-5568
	Fahrudin Zulcic	Service Manager		(626) 430-5595	
	Lusi Mkhitaryan	Chief, Drinking Water Program		(626) 430-5420	

If none of the above personnel can be reached, please contact:

Office of Emergency Services Warning Center (24 hrs):
(800) 852-7550 or (916) 845-8911

When reporting a water quality emergency to the Warning Center, please ask for the California State Water Resources Control Board – Division of Drinking Water Duty Officer.

Appendix C contains a full list of the contact information for personnel to be contacted during a water quality emergency (within the 2021 version of the Water Quality Emergency Notification Plan).

Public Notification

There are several notification templates that can be used to notify the public during water quality incidences. The three types of water quality emergency notifications are:

- Boil Water Notices (BWN)
- Unsafe Water Alerts (UWA)/Do Not Drink Notices
- Do Not Use Notices

A detailed description of each situation is given further in this section. The public notification templates that can be issued per emergency situation are attached in **Appendix D.**

3.1.1 Consumer Alert During Water Outages or Periods of Low Pressure

In the situation that the water system is experiencing water outages or issues with low pressure due to rolling power outages, customers of the water system may be issued a notification.

The alert will instruct customers to discontinue any non-essential water usage in order to help conserve water and minimize low pressure issues within the water system. The notice will also provide directions on treating water with household bleach to ensure its safety if the water appears cloudy or dirty.

The Director of Public Works is the one responsible for making the decision if or when a consumer alert during water outages or periods of low pressure caused by rolling power outages will be issued. This public notification template that will be used during this situation is attached in **Appendix D**.

3.1.2 Boil Water Notice (BWN)

A Boil Water Notice (BWN) should be issued when minimum bacteriological water quality standards cannot be reasonably assured, however, the water can be rendered safe to drink when boiled or disinfected appropriately.

Examples of this situation include, but are not limited to:

1. Biological contamination of water supply system such as:
    - Prolonged water outages in areas with ruptured sewer and/or water mains

- Failed septic tank systems in close proximity to ruptured water mains
- Ruptured water treatment, storage, and/or distribution facilities in areas of known sewage spills or other biological contamination
- Cross connection contamination problems
- Illness attributed to water supply

2. Unusual system characteristics such as:
   - prolonged loss of pressure
   - sudden loss of chlorine residual
   - severe odor and discoloration
   - inability to implement emergency chlorination
3. Implemented due to treatment inadequacies

The public will be instructed to not drink water from the system unless boiling or disinfecting it appropriately. Detailed instructions will be given on this public notice for manual disinfection by customers of the water supply. The public notification template that can be issued for this emergency situation is attached in **Appendix D**.

3.1.3 Unsafe Water Alert (UWA) or Do Not Drink Notice

An Unsafe Water Alert (UWA) or Do Not Drink Notice should be issued when there is a water quality emergency due to a known or suspected chemical (non-bacteriological) or hazardous contamination to the water system. The water supply is contaminated in such a way that it cannot be made safe by boiling the water.

Examples of this situation include, but are not limited to:

1. Known or suspected widespread chemical or hazardous contamination in water supply distribution such as:
   - Ruptured water distribution system (storage tanks, mains) in area of known chemical spills coupled with loss of pressure
   - Unusual system characteristics such as severe odor and discoloration or loss of chlorine residual
   - Inability of existing water treatment processes to neutralize chemical contaminants prior to entering the distribution system
2. Threatened or suspected acts of sabotage confirmed by analytical results
3. Implemented due to treatment inadequacies

This UWA or Do Not Drink Notice will notify public to not drink water from the water distribution system until further notice. It will also mention specifically for

the public to not attempt to make the water safe by any sort of disinfection means. The public notification template that can be issued for this emergency situation is attached in **Appendix D**.

3.1.4 Do Not Use Notice

A Do Not Use Notice should be issued when the water supply has been contaminated by an unknown contaminant or exposure to the water may cause adverse health effects.

Examples of this situation include, but are not limited to:

1. Known or suspected widespread chemical or hazardous contamination in water supply distribution, including but not limited to:
    - Terrorist contamination event.

The public will be instructed to not use water from the distribution system for drinking, cooking, sanitation purposes, or any other cases. The public notification template that can be issued for this emergency situation is attached in **Appendix D**.

3.1.5 Issuing an Unsafe Water Notification

The Director of Public Works is the one responsible for making the decision if or when a Boil Water Notice (BWN), Unsafe Water Alert (UWA)/Do Not Drink Notice, or Do Not Use Notice should be issued within the City of La Verne.

The City will ensure that all public notifications are coordinated with the State Water Resources Control Board (SWRCB) Department of Drinking Water (DDW) District Engineer, County Environmental Health Department, and the County Public Health Officer prior to issuing a public notice. This will ensure that response actions are coordinated between agencies.

In the case that a public water system is not capable or does not issue public notification when directed by the SWRCB, the notice can be issued by any of the personnel from the following agencies:

- State Water Resources Control Board (SWRCB) Department of Drinking Water (DDW) designated personnel: District Engineer, Regional Engineer or Branch Chief.
- Local County Health Department designated personnel: County Health Officer or Director of Environmental Health Department for small water systems under county jurisdiction.

Public notification will include rapid means of communication in appropriate languages. Methods include, but are not limited to:

- Electronic transmission and broadcasts on the air by local television and/or radio stations
- Loud speak announcements in localized affected area(s)
- Posting at readily visible public locations (building entrances, commercial establishments, telephone poles, schools, and factories, billboards, etc.)
- Hand-carried notices from door to door
- Mailing of follow-up notice to confirm emergency if appropriate

3.1.6 Canceling an Unsafe Water Notification

Once any unsafe water notification is issued, the only agency that can rescind the public notice is the SWRCB DDW. The required measures and sampling that must be done is dependent on the particular reason for the notice. The State Board will determine the appropriate corrective action and monitoring. Once the water system has corrected the deficiency and satisfactory sampling results are received, the State Board will cancel the UWA.

Cancellation of a public notification will be communicated in similar way as the original notification. The cancellation template that can be issued per emergency situation is attached in **Appendix D**.

Emergency Chlorination

Portable chlorination systems can be installed at the applicable booster sites to maintain a desired residual in the pressure zone. The chlorination of a specific area can be accomplished by installing portable chlorinators, applicable valve closures, and hydrant flushing where necessary to draw chlorinated water to the desired destination. Granular calcium hypochlorite (65% available chlorine) can also be added to any reservoir to provide necessary disinfection to a given pressure zone.

Chlorination should be dosed to provide 2 ppm free chlorine residual. A minimum of 0.5 ppm must be maintained throughout the distribution system. Once chlorination is implemented, it is crucial to conduct follow up distribution chlorine residual monitoring to determine the effectiveness of the chlorination process. Areas containing suppressed residuals may receive further investigation to determine if there are problems associated with the reduced residuals.

It is critical that field maintenance staff are familiar with installation procedures so that chlorination equipment by installed in an effective and timely manner during an emergency.

Emergency Chlorination Procedures

The installation of emergency chlorination equipment and the setting of the chemical dosages in order to maintain an acceptable free chlorine residual may be needed to ensure public health protection following a disaster.

Items that are either required or recommended to perform this emergency chlorination plan are the following:

- Emergency chlorination units
- Chlorine residual test kits (preferably a DPD test)
- Granular Calcium Hypochlorite, 65% available chlorine is recommended, but other types of chlorine are allowable (liquid sodium hypochlorite, e.g. bleach has a relatively short shelf life so it is advisable that it not be purchased in advance)

Installation Procedure

If you find that you are unable to perform these calculations, contact a DDW staff member immediately. Contacts of personnel of the State DDW in are Table 3-3.

The chlorination equipment must be adequately sized for the proposed installation. The feed capacity of the hypochlorinator should allow the Utility to dose at a minimum of 5 ppm free chlorine residual. After the emergency chlorination units have been physically connected to the wells or other sources required, the following procedures may be followed to calculate the appropriate settings. Depending on known values, Table 3-4 and Table 3-5, or equations may be used to obtain appropriate settings.

1. **Using Table 3-4 to obtain Chlorination Equipment Settings**

Determine a desired solution strength and the type of chlorine that is available to be used. Then find the amount of chlorine required for a 100 gallon barrel using the table shown in Table 3-4. This table can also be found in **Appendix E**.

The gallons of water needed will be 100 gallons minus the gallons of chlorine determined from the chart.

For example:

- For a 10% solution using 12.5% bleach, use 80 gallons of bleach and add 20 gallons of water.
- For a 10% solution using 65% available Calcium Hypochlorite (CaHOCl), use 128 lbs of granular chlorine and add water to fill barrel and mix.

Table 3-4 Amount of Chlorine per 100 Gallon Barrel

Type of Chlorine / Solution Strength	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
5% Bleach Household Bleach (Clorox)	60 gal	80 gal	100 gal								
12.5% Bleach Commercial Bleach	24 gal	32 gal	40 gal	48 gal	56 gal	64 gal	72 gal	80 gal	88 gal	96 gal	
65% Calcium Hypochlorite (HTH, tablets or granular chlorine)	38 lbs	51 lbs	64 lbs	77 lbs	90 lbs	103 lbs	116 lbs	128 lbs	141 lbs	154 lbs	167 lbs

Table 3-5 is used to determine the volume of solution (in gpd) to be added for varying flow rates for respective solution strengths (mg/L) of chlorine dosages. The volume picked from Table 3-5 (**Appendix F**) is then divided by the feed pump capacity to obtain the appropriate length of stroke setting.

It is important to note that large capacity wells require a stronger solution strength or the feed barrel will be filled too frequently.

Table 3-5 Chlorine Volume Required Gallons Per Day (GPD) Per mg/L or PPM of Desired Chlorine Dosage

Flow Rate / Solution Strength	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%
50 gpm	2.4	1.8	1.4	1.2	1.03	0.9	0.8	0.7	0.7	0.6	0.6
75 gpm	3.6	2.7	2.2	1.8	1.5	1.4	1.2	1.1	1.0	0.9	0.8
100 gpm	4.8	3.6	2.9	2.4	2.1	1.8	1.6	1.4	1.3	1.2	1.1
300 gpm	14.4	10.8	8.6	7.2	6.2	5.4	4.8	4.3	3.9	3.6	3.3
500 gpm	24.0	18.0	14.4	12.0	10.3	9.0	8.0	7.2	6.6	6.0	5.5
800 gpm	38.4	28.8	23.0	19.2	16.5	14.4	12.8	11.5	10.5	9.6	8.9
1000 gpm	48.0	36.0	28.8	24.0	20.6	18.0	16.0	14.4	13.1	12.0	11.1
1500 gpm	72.0	54.0	21.5	36.0	30.9	27.0	24.0	21.6	19.6	18.0	16.6
2000 gpm	96.0	72.0	57.6	48.0	41.1	36.0	32.0	28.8	26.2	24.0	22.2

For example:

Using a Feed Pump Capacity of 10 gph, Flow Rate of 1,500 gpm, a 7% solution, and 5 mg/L dosage

Table 3-5 -> Chlorine Volume = 30.9 gpd for each mg/L

For 5 mg/L, a total of 5 x 30.9 = 154.5 gpd is used

Since the feed pump has a maximum capacity of 10 gph, the appropriate length of stroke setting is: $\frac{154.5 \text{ gpd}}{24 \text{ hr x } 10 \text{ gph}} = 0.64$

Set the dial for 64% of maximum

2. **Using Equations to achieve appropriate length of stroke**

The solution strength of the chemical must be obtained. This is achieved through determining the known weight of a chemical being added, and dividing by the weight of water. 1 gallon of water is equivalent to 8.34 lbs.

$$\%\, Solution = \frac{Weight\ of\ Chemical\ Added\ to\ Solution\ Barrel\ (lbs)}{Weight\ of\ Water\ in\ Solution\ Barrel\ (lbs)}\ X\ 100\%$$

The following step is to calculate the pounds per hour of chemical that must be added to obtain a known chlorine concentration.

$$lbs\ per\ hour = \frac{8.34\ lbs\ X\ desired\ dosage\ in\ ppm\ X\ Flow\ rate\ (gpm)\ X\ 60\ min}{1{,}000{,}000}$$

Next, the required gallons per hour of chemical must be added.

$$Gallons\ per\ hour\ of\ chemical = \frac{lbs\ per\ hour}{8.34\ lbs\ X\ solution\ strength\ X\ 100}$$

Review the maximum feed rate in gallons per day of the chemical feed pump. This is generally printed on a label attached to the pump. It may specify the discharge pressure this maximum rate applies to. Additionally, most chemical feed pumps have a length of stroke setting, or two settings for frequency of stroke and length of stroke. If two control settings are provided, then set the frequency control at 100% and provide adjustments only to the length of stroke adjustment. The following equation can be used to determine which setting the length of stroke should be if there are more than 1 settings.

$$Percent\ Length\ of\ Stroke = \frac{Gallons\ Per\ Hour\ of\ chemical\ X\ 24\ hours}{Pump\ Capacity\ in\ gpd}\ X\ 100\%$$

This setting value should be used when adjusting the pump. If both pump settings are to be adjusted from 100%, then the percent stroke equation is as follows:

$$Percent\ Length\ of\ Stroke\ = \frac{Gallons\ Per\ Hour\ of\ chemical\ X\ 24\ hours}{Stroke\ Frequency\ X\ Pump\ Capacity\ (gpd)} X\ 100\%$$

Actual dosage can be checked by using the total gallons of solution pumped within a known operating period.

$$Actual\ Dosage\ = \frac{Gallons\ of\ solution\ X\ Solution\ Strength}{Gallons\ of\ Water\ Treated\ (MG)}$$

Once chlorination is implemented through these steps, conduct follow up chlorine residual monitoring using chlorine residual test kits throughout the distribution system. Evaluate the effectiveness of the chlorination process. Areas containing suppressed residuals may receive further investigation to determine if there are problems associated with the reduced residuals. Bacteriological sampling of the distribution system in all areas should also be conducted. In the case of an emergency, hypochlorination equipment at a dosage of 2 ppm of free chlorine residual should be used to dose the system.

Chlorination through this plan should continue until it has been confirmed that no issues exist within the distribution system and all bacteriological monitoring shows that there is no presence of pathogenic organisms.

Section 4 - Implement Emergency Instructions and Communication

General Information

The following actions should be taken during the start of an emergency incident:

- In the event of an emergency, all off duty employees shall report to the city yard or to the nearest possible substitute location after ensuing the well-being of their families.
- Supervisors are authorized to care, to the extent resources allow, for the emergency physical needs of family members of on duty employees who cannot be released from duty during a proclaimed emergency situation.
- On duty employees shall have immediate responsibility to begin an assessment of damage and report observations to the Public Works Director or a Manager.
- Employees assigned to specific emergency tasks shall perform those tasks as their highest priority.
- When responding to field media inquiries regarding the emergency, only factual responses shall be made, employees will avoid speculation, conjecture, or statements of opinion.

Standardized Emergency Management System (SEMS)

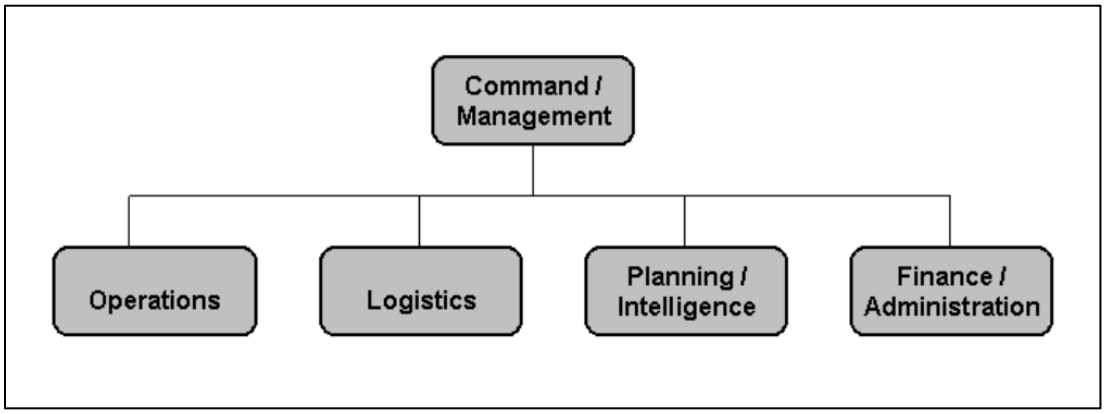
The Standardized Emergency Management System (SEMS) is as system that organizes response to emergencies. The clear and consistent organizational structure that can be shared between agencies using SEMS allows agencies to work together more efficiently and effectively. SEMS will be used during an emergency when it is classified as a Level #3 or Level #4. The way that emergencies are classified is discussed in Section 2.

SEMS Functions

There are five principal functions within SEMS at each of the five organizational levels. They are:

1. Command/Management
    a. Command
    b. Management
2. Operations
3. Planning/Intelligence
4. Logistics
5. Finance/Administration

Figure 4-1 SEMS Functions



The general responsibilities of each of these five roles is discussed in Table 4-1. The functions of these roles can differ depending on the emergency incident.

Table 4-1 SEMS Level Responsibilities

Level	Responsibilities
Command/Management	• Command: o Directing personnel and controlling resources at the field response level • Management: o Management of EOC o Communicates information with public, other EOCs, and the media o Decides priority of tasks
Operations	• Coordinates and supports operations regarding primary mission • Implements tasks prioritized by Management
Logistics	• Procures equipment, materials and any supplies needed to support operations • Oversees distribution and storage of supplies • Tracks the status of resources and personnel
Planning/Intelligence	• Manages, records and evaluates information related to situation • Predicts and prepares strategies to solve the problems at hand • Conducts damage assessments using information provided
Finance/Administration	• Manages financial, administrative and cost accounting and analysis of the incident • Prepares vendor contracts, records of expenditure and procurement claims

Emergency Operations Center (EOC)

The Emergency Operations Center (EOC) is the location from which emergency management can be performed during an incident. The decision to activate the EOC will be decided by the Director of Public Works upon knowing or receiving information regarding an incident. The EOC for the City will be located at the City Hall.

City Hall Address and Contact:
3660 D St, La Verne, CA 91750-3599
(909) 596-8741

The following tasks will be performed at the EOC:

- Managing and coordinating during emergency operations
- Receiving and disseminating intelligence and warning information internally (between City staff) or externally (to the public)
- Developing emergency policies and procedures
- Preparing intelligence/information reports as required.
- Maintaining maps, information display boards, and other data pertaining to emergency operations
- Continuing analysis and evaluation of all data pertaining to emergency operations.
- Maintaining contact and coordination with other local government EOCs and the Los Angeles County Emergency Operations Center

Emergency Actions

Emergency Communications

The primary internal emergency communication method will be by two way radio between the EOC and field operation personnel. If there is a power failure, standby generators will need to be activated at the EOC and water production facilities. Handheld battery operated radios and truck unit radios will be used between field staff for communication.

If telephones or cellular phones are out of service, communication with other agencies, the LA County EOC, or the State Office of Emergency Services may require messages to be relayed by police or fire department personnel. These external response partners and their contacts are listed in the tables below.

Internal Emergency Response Roles

There are several personnel with specific emergency response roles within the City of La Verne. These roles include their responsibilities under their level of SEMS as well.

The Emergency Response Lead (ER Lead) will be the main point of contact during an incident. An Alternative ER Lead will take on the responsibilities of the ER Lead in the case that he or she cannot act in the event of an emergency. The ER Lead for the City of La Verne is the Director of Public Works. The Alternate ER Lead is the Deputy Director of Public Works.

Table 4-2 includes the list of personnel with specific emergency response roles within the City and their contact information. The general roles of staff during an emergency incident are discussed in Table 4-1.

Table 4-2 Internal Emergency Response Roles and Contacts

Response Role	Description of Role	Location during an Emergency
Public Works Director/ Utilities Manager	• Assess and classify emergency • Prioritize needs during incident • SEMS facilitator • Convey information to media/public	EOC
Finance/ Representative	• Radio/telephone communications • Financial resources and procurement • Convey information to public	EOC
Maintenance Supervisor	• Damage assessment • Prioritize repairs • Assign and dispatch personnel	Field Operations
Lead Workers and Maintenance Staff	• Respond • Patrol • Report • Repair	Field Operations

External response partner agency personnel also play a critical role in the case of an incident. There are several agencies that the City of La Verne has formed a partnership with. This is discussed more in depth in further sections of this emergency response plan.

External Response Partners

There are several agencies that the City of La Verne has formed a partnership within order to be provided assistance during an emergency situation. Different agencies may be contacted depending on the type of incident. The Emergency Response Lead/Director of Public Works will make the decision as to which of these agencies should be notified and when.

In the absence of management, the employee(s) on duty shall have authority to act in the best interest of the City. These external response partners and their contacts are listed in the tables below.

Emergency Medical Facilities

Emergency Medical Services contacts can be found in Table 4-3.

Table 4-3 Emergency Medical Facilities

Type of Facility	Name of Facility	Address	Phone Number
Ambulance/ La Verne Paramedics	-	-	(909) 596-1913
Emergency Clinic and Hospitals	Central Ave Urgent Care Center (Available 24hrs/7 days)	8891 Central Ave, Montclair, CA 91763	(909) 297-3361
	Pomona Valley Hospital (Available 24hrs/7 days)	1798 N. Garey Ave, Pomona 91767	(909) 865-9500
	San Dimas Community Hospital (Available 24hrs/7 days)	1350 W. Covina Blvd, San Dimas CA 91773	(909) 599-6811
	Pomona Valley Health Center @ La Verne	2327 Foothill Blvd, La Verne, CA 91750	(909) 392-6501

Fire and Law Enforcement Stations

Fire and Law Enforcement Station contacts can be found in Table 4-4.

Table 4-4 Fire and Law Enforcement

Type of Facility	Name of Facility	Contact
Fire Station	La Verne Fire Department (Emergency Phone Number is Available 24hrs/7 days)	(909) 596-1913 or 911
Law Enforcement	City of La Verne Police (Emergency Phone Number is Available 24hrs/7 days)	(909) 596-1913 or 911
	California Highway Patrol (Emergency Phone Number is Available 24hrs/7 days)	(909) 980-3994 or 911
	Federal Bureau of Investigation	(310) 477-6565 los.angeles@fbi.gov

State Water Resources and County Health Department

State Water Resources and County Health Department contacts can be found in Table 4-5.

Table 4-5 State Water Resources and County Health Department

Type of Facility	Name of Personnel or Department	Name of Personnel	Address	Phone Number
State Water Resources Control Board	Department of Drinking Water	Chi Diep, P.E., District Engineer	-	(818) 551-2016 DAY (213) 309-3822 NIGHT (818) 551-2054 FAX
LA County Health Services Department	Water, Sewage, and Subdivisions Section	-	5050 Commerce Dr, Baldwin Park, CA 91706-1423	(626) 430-5420 PHONE (626) 813-3013 FAX (818) 700-9995 AFTER HOURS

Los Angeles County Department of Public Works, City of La Verne, and Dig Alert

Dig alert contact (the underground service alert of southern California for marking of underground facilities prior to excavating), the LA County Department of Public Works, and the City of La Verne's contacts can be found in Table 4-6.

Table 4-6 Los Angeles County Department of Public Works, City of La Verne, and Dig Alert

Type of Facility	Division	Address	Contact
LA County Department of Public Works	-	900 Fremont Ave, Alhambra, CA 91803-1331	(626) 458-5100 dpw.lacounty.gov (800) 675-4357 for emergencies
	Permits and Construction Division		(626) 458-3129 (626) 458-4949 FAX
City of La Verne	Building and Safety Division	-	(909) 596-8713 (909) 596-8737 FAX
Dig Alert	-	-	(800) 422-4133

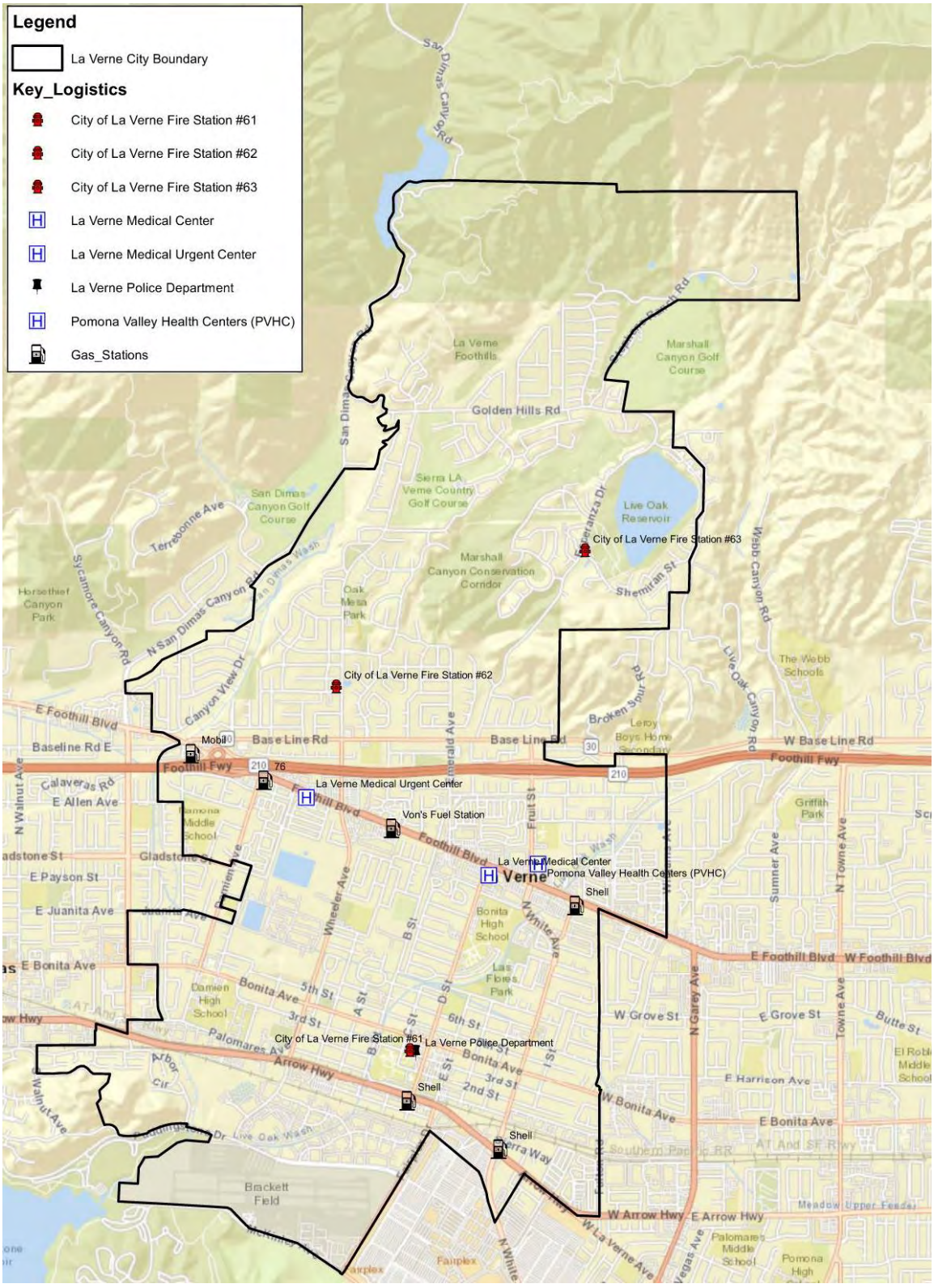
Key Local Services

During an emergency, usage of key logistical and medical services may be necessary for staff, mutual aid, and assistance providers. Figure 4-2 shows all hospitals, gas stations, fire stations, and police departments within the City of La Verne. The addresses of key locations are in Table 4-7.

Table 4-7 Key Logistics Locations

Type of Facility	Facility	Addresses
Fire Station	Fire Station #61	2061 3rd St
	Fire Station #62	4785 Wheeler Ave
	Fire Station #63	5100 Esperanza Dr
Medical	La Verne Medical Center	2100 Foothill Blvd
	La Verne Medical Urgent Center	1234 Foothill Blvd
	Pomona Valley Health Centers (PVHC)	2333 Foothill Blvd
Police	La Verne Police Department	2061 3rd St
Gas Stations	Shell	1808 N White Ave
		1947 D St
		2510 Foothill Blvd
	Von's Fuel Station	1604 Foothill Blvd
	76	1120 Foothill Blvd
	Mobil	914 W Foothill Blvd

Figure 4-2 Key Services within the City of La Verne



Reporting of a Significant Incident

In the case of an occurrence or incident that could cause the City to be liable, a certain response procedure is required by the employee or employees involved in the incident.

It is the responsibility of all City employees to immediately notify the Risk Manager upon knowing or witnessing a significant incident. Prompt reporting of information will allow the California Joint Powers Insurance Authority (JPIA) defense counsel to perform a through and timely claim investigation of the occurrence reported.

The employee or employees involved in the situation must also fill out a confidential form that can be found in Appendix G. This form will provide the California JPIA with details and information about the significant that can be used in their investigation.

In the case of a significant incident, the following steps must be performed:

WHAT TO DO IN CASE OF A SIGNIFICANT INCIDENT

1. MAKE NO COMMENT AS TO YOUR OPINION REGARDING CAUSE, FAULT OR LIABILITY.
2. Notify agency risk manager as soon as possible.
3. Complete this form as follows (located in Appendix G):
    A. Enter the date and time of the incident.
    B. Identify and enter the name of the person(s) sustaining injury or a description of the property damages, if applicable.
    C. Describe the exact location where the incident occurred.
    D. Briefly describe how the incident occurred.
    E. Briefly describe the damages or injuries observed.
    F. Describe weather conditions (was surface condition slippery, etc.).
    G. Obtain names, addresses and telephone numbers of persons involved or witnessing the incident.
4. If the person involved makes statements about filing a claim to you, advise that claims must be made with the agency clerk.

5. If the person does not make statements about filing a claim to you, do not volunteer information. This is an internal report. Do not provide copies of this report to other parties.

6. If contacted by the Risk Manager or a California Joint Powers Insurance Authority representative furnish requested information as accurately and as quickly as possible.

7. All persons, other than agency personnel, seeking accident information should be referred to the agency clerk or risk manager.

8. Give other persons involved your name and agency address.

9. Please include newspaper clippings, police reports or other supplementary information you may have relating to this incident.

See Appendix G for attachments regarding protocol for reporting of a significant incident as well as the form to be filled.

Section 5 - Prioritize Damage to be Repaired and Determine Necessary Work

Damage Priority

During an emergency incident, these priorities should be done in order of greatest to least importance for all staff when applicable:

- Act to protect life
- Preserve water in storage
- Consider what can be saved and what can be sacrificed
- Assess damage to sewer system because it could contaminate water supply
- Implement emergency chlorination plan if contamination is suspected
- Isolate areas that will take longest to restore service and arrange for emergency water distribution
    - Establish locations for emergency water distribution
    - Make bottled water available or get trucks with water tanks to fill customer containers
- Identify areas that can be served with minimum of repair and list repairs
- Set priorities on repair work
    - Plan to restore service area by area
    - Prepare and keep current a plan to restore service
    - Get input from EOC on essential areas
    - Take into account the condition of feeder lines
    - Keep in mind the need for fire protection
    - Determine if imported water is available from bordering systems
    - When work exceeds capabilities of work force notify EOC

Dispatch personnel and equipment to begin repairs

Response Resources

Having an accurate inventory of available resources that are maintained either onsite or readily available offsite allows utility responders to know what resources are immediately available during an incident.

An inventory list of equipment and materials located in the emergency room is complied and maintained in each department's office.

Communication Equipment Inventory

Maintaining communication equipment is an important part of ensuring effective communication internally and externally in the case of an incident. Standard landline telephones are used for communication. Service plans and contracts are checked regularly to ensure that they are current.

Health and Safety

There are no printed handbooks containing the health and safety protocol that the City follows. Instead, City staff participate in safety meetings every other Wednesday morning for approximately 30 to 40 minutes in length. As a result of these meetings and their frequencies, staff are well versed in health and safety standards and will be able to act accordingly in the event of an emergency.

Communication with Critical Customers

Critical customers will be given priority when notifying customers of an emergency due to their reliance on the water supply. The Emergency Response Lead will decide which of these customers needs to be contacted depending on the type of incident. The list of critical customers is shown in Table 5-1 along with their corresponding addresses and contact number. All addresses are located within the City of La Verne.

Table 5-1 List of Critical Customers

Critical Customers	Address	Contact
La Verne Fire Department – Station I	2061 Third St	(909) 596-5991
La Verne Fire Department – Station II	4785 Wheeler Ave	(909) 596-5997
La Verne Fire Department – Station III	5100 Esperanza	(909) 593-1681
La Verne Police Department	2061 Third St	(909) 596-1913
La Verne City Hall	3660 D St	(909) 596-8726
La Verne City Yard	2620 First St	(909) 596-8736
La Verne Community Center	3680 D St	(909) 596-8700
La Verne Library	3640 D St	(909) 596-1934
Metropolitan Water District	700 Moreno Ave	(909) 593-7474
Verizon	-	(800) 483-2000
City Reservoirs	3660 D St	(909) 596-8741
Pomona Valley Health Center @ La Verne	2333 Foothill Blvd	(909) 392-6511
Pomona Valley Medical Center	1798 N. Garey Ave	(909) 623-8715

Section 6 - Request Aid

During and after an incident, requesting aid and utilizing resources is crucial to ensure recovery and restoration of normal service. When problems are beyond the capability of the City, contact External Response Partners as needed.

External Response Partner Communication

If there were an emergency situation where external assistance would be needed, there are several agencies that the City of La Verne has formed a partnership for those particular situations. Different agencies may be contacted depending on the type of incident.

The Emergency Response Lead will make the decision as to which of these agencies should be notified and when. In the absence of management, the employee(s) on duty shall have authority to act in the best interest of the City. These external response partners are listed in below along with their corresponding table containing contact information.

- Pipeline Contractors (Table 6-1)
- Engineering (Table 6-2)
- Water Testing Laboratory (Table 6-3)
- Backfill and Paving Materials (Table 6-4)
- SCADA Telemetering-Controls (Table 6-5)
- Electrical Contractors (Table 6-6)
- Pump Repairs and Supplies (Table 6-7)
- Equipment Rental Yards (Table 6-8)
- Repair Parts and Supplies (Table 6-9)
- Bottled Water Supplies (Table 6-10)
- Nearby Agencies (Table 6-11)

If telephones or cellular phones are out of service, communications with other agencies may require message information to be relayed by police or fire department personnel to the Los Angeles County EOC.

Los Angeles County EOC Address and Contact:
1275 N. Eastern Ave, Los Angeles, CA 90063
(323) 980-2200

Table 6-1 Pipeline Contractors

Company Name	Name	Address	Phone Number	After Hours Emergency Numbers
Gentry Brothers, Inc.	Wayne or Steve	384 E. Live Oak Ave Irwindale, CA	(626) 357-9631 (626) 482-2225 (CELL) (909) 880-8640 (FAX)	-
Bob Brkich Construction	Office	1508 South Mayflower Ave Monrovia, CA	(626) 305-7426	-
	Bobby		(626) 308-7426 (CELL)	
	Johnny Lima		(626) 945-0606 (CELL)	
Doty Brothers Equipment Co., Inc. (LIC #273024)	-	11232 Firestone Blvd Norwalk, CA 90640	(562) 864-6566 (562) 864-6052 (FAX)	(562) 864-6566
Valverde Construction, Inc. (LIC #276469)	Mike Valverde	10936 Shoemaker Ave Santa Fe Springs, CA 90670	(562) 906-1826 (562) 906-1918 (FAX)	(562) 947-4180 (310) 877-2855 (CELL)
	Ed Valverde			(562) 943-2186 (310) 420-2167 (CELL)
	Ahron Valverde			(562) 947-7873 (562) 244-4705 (CELL)
	John Dip			(626) 288-4016 (626) 255-0770 (CELL)

Table 6-2 Engineering

Company Name	Name	Address	Phone Number	Website
Civiltec Engineering, Inc.	W. David Byrum	118 West Lime Ave Monrovia, CA 91016	(626) 357-0588 (626) 303-7957 (FAX)	www.civiltec.com
	C. Shem Hawes			
	David Song			

Table 6-3 Water Testing Laboratory

Company Name	Address	Phone Number
E.S. Babcock & Sons, Inc.	6100 Quail Valley Court Riverside, CA 92507-0704	(951) 653-3351 (951) 653-1662 (FAX)

Table 6-4 Backfill and Paving Materials

Company Name	Address	Phone Number
Gentry Bros Construction, Inc.	384 E. Live Oak Ave Irwindale, CA 91706	(626) 357-9631 (626) 357-6322 (FAX)
Vulcan Materials Company (Calmat Division) (Account #540059)	16001 Foothill Blvd Irwindale, CA 91702	(626) 856-6156 (626) 334-4161 (FAX) (626) 865-6143 (For Rock or Sand)

Table 6-5 SCADA Telemetering-Controls

Company Name	Name	Address	Phone Number
Trimax	Chris McLaughlin	565 West Explorers Street Brea, CA 92821	(714) 255-8590 (714) 255-1922 (FAX) (714) 582-0740 (Chris)
Tesco	-	42015 Remington Ave #102 Temecula, CA 92590	(916) 395-8800
JAR Automation	Richard Chon	15970 Los Serranos Country Club Dr, PMB #125, Chino Hills, CA 91709	(626) 824-0464
Morrow Meadows Electric	Steve Marlow	231 Benton Court City of Industry, CA 91789	(909) 772-7821 (CELL)

Table 6-6 Electrical Contractors

Company Name	Name	Address	Phone Number
Morrow Meadows Electric	Steve Marlow	231 Benton Court City of Industry, CA 91789	(909) 772-7821 (CELL)
Cico Electric	Cilo	365 Whipporwill Dr Riverside, CA 92507	(951) 213-2229 (323) 482-0611 (Cilo)

Table 6-7 Pump Repairs and Supplies

Company Name	Address	Phone Number
Layne Christensen Company	1717 W. Park Ave Redlands, CA 92373	(909) 390-2833 (909) 390-5540 (FAX)
Tri County Pump Company	241 S. Arrowhead Ave San Bernardino, CA 92408	(909) 888-7706 (909) 888-3653 (FAX)
General Pump Company	159 N. Acacia Street San Dimas, CA 91773	(909) 599-9606 (909) 599-6238 (FAX)

Table 6-8 Equipment Rental Yards

Company Name	Address	Phone Number
United Rentals	10632 Monte Vista Ave Montclair, CA 91763	(909) 624-9615 (800) 877-3687
Hometown Rentals	2610 N. Garvey Ave Pomona, CA 91767	(909) 596-3799

Table 6-9 Repair Parts and Supplies

Company Name	Address	Phone Number	After Hours Emergency Number
S&J Supply Company, Inc.	13105 Florence Ave Santa Fe Springs, CA 90670	(562) 944-7433 (562) 944-7224 (FAX)	(888) 520-1226
Western Water Works Supply Company, Inc.	-	(909) 597-7000 (800)-834-2666 (909) 597-7050 (FAX)	(909) 597-7000
J.W. Dangelo Co.	601 S. Harbor Blvd La Habra, CA 90631	(562) 690-1000	(562) 497-0122
United Water Works, Inc.	1313 Hunter Ave Santa Ana, CA 92705	(714) 542-0711	-
Matt Chlor, Inc. (Chlorination/Disinfection)	4107 North Arden Dr El Monte, CA 91731	(626) 443-5034 (626) 443-2226 (FAX)	(626) 253-6465 (24 Hour Line)
Basic Chemical Solutions (Sodium Hypochlorite)	-	(800) 597-7868 (562) 944-7244 (562) 903-0056 (FAX)	(800) 424-9300 (For emergency spills (CHEMTREC))
Hasa Inc.	1415 E. 3rd Street Pomona, CA 91766	-	-
Home Depot Inc.	2707 S. Town Ave Pomona, CA 91766	(909) 627-9400	-
	1305 S. Lonehill Ave Glendora, CA 91740	(909) 394-1400 (909) 394-1402 (FAX)	-

Table 6-10 Bottled Water Supplies

Company Name	Address	Phone Number
Rocky Mountain Water	10260 Matern Pl Santa Fe Springs, CA 90670	(562) 946-5000 (562) 946-4352 (FAX)
Yosemite Water (Santa Ana Location)	-	(800) 273-4026 (714) 870-4022 x 136 (714) 870-4060 (FAX)
Sparkletts Drinking Water	-	(800) 453-0295 (800) 824-8525 (626) 472-7201

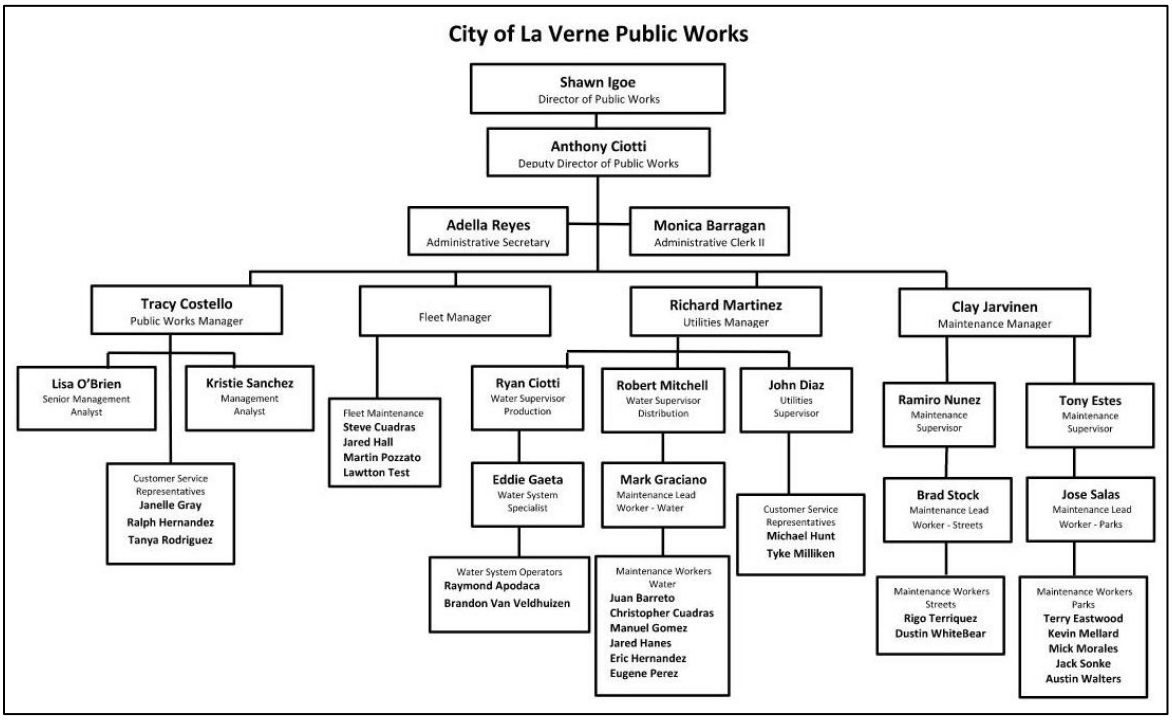
Table 6-11 Nearby Agencies

Agencies	Address	Phone Number	Emergency Number
City of Pomona Water Department	148 N. Huntington Street Pomona, CA 91768	(909) 620-2231 (909) 620-2030	-
Rowland Water District	3021 S. Fullerton Rd Rowland Heights, CA 91748	(562) 697-1726 (562) 697-6149	-
Golden State Water Company	630 E. Foothill Blvd San Dimas, CA 91773	(909) 394-3600 (909) 394-0711 (FAX)	(800) 758-6790
City of Santa Fe Springs	11710 Telegraph Rd Santa Fe Springs, CA 90670	(562) 868-0511 (562) 868-7112 (FAX)	-
La Verne Police Department	2061 3rd Street La Verne, CA 91750	(909) 596-8913	911
Three Valleys Municipal Water District	1021 E. Miramar Ave Claremont, CA 91711	(909) 621-5568 (909) 625-5470 (FAX)	(909) 477-9698 (After hours - Steve Lang)
Walnut Valley Water District	271 Brea Canyon Rd Walnut, CA 91789	(909) 595-7554 (909) 444-5521	(909) 464-3163 (After hours)

Organization Chart

The organization chart for the City is shown in Figure 6-1. It can also be found in Appendix H.

Figure 6-1 City of La Verne Organization Chart



SEMS Contact

If the City's EOC is activated, forward Utility outage and restoration status report by fax or directly to the EOC by radio or telephone.

Section 7 - Mutual Aid Agreement and Access

California Water/Wastewater Agency Response Network (CalWARN)

After or during the occurrence of a disaster, further mutual aid is for the City through the California Water/Wastewater Agency Response Network (CalWARN). The city has a mutual aid assistance agreement with CalWARN. CalWARN consists of a group of water and wastewater agencies in a legal agreement to assist each other during an emergency by sharing resources with one another. The CalWARN Mutual Aid/Assistance Operational Plan was signed by the City in September 2008 and was updated in March 2009.

To contact WARN during an emergency, use the following website:
www.calwarn.org

For username and password, please contact the Utilities Manager.

Mutual Aid Agreement with Surrounding City and TVMWD

Three Valleys Municipal Water District (TVMWD) has a mutual aid agreement with several cities, including the City of La Verne. In the case of an emergency incident, TVMWD can be contacted for assistance.

Section 8 - Media-Public Information

Communication with the media is critical during an emergency situation in order to convey information to the public. Broadcasts and print media will be used to inform customers of the water system when an issue arises. Public information will also be made available at the City's Emergency Operations Center.

General Information

A summary of rules to follow when communicating with media agencies about an emergency is as follows:

- Centralize news releases and statements to avoid confusing the public.
- Make public information available at the EOC.
- Coordinate information releases with state and county health departments if possible.
- When responding to inquiries, make only factual responses. Avoid speculation.
- Inform public of probable contamination of water supply if breaks are found in lines.
- Notify public of availability of water and precautions to be taken.
- Use broadcast and print media to inform City customers.

Media Agency Contacts

Staff have been directed to forward questions and information requests by the media to the Director of Public Works. When responding to inquiries, speculation should be avoided and only factual responses given.

The contact information of the media agencies can be found in Table 8-1.

Table 8-1 List of Media Contacts

Type	Agency	Phone	Other Contact
Social Media	Tripepi Smith	213-833-8069	Clare Burgess - clare@tripepismith.com Emily Mason - emily@tripepismith.com
Radio	KFWB, 980 AM	(323) 851-5959 (323) 512-4690 (FAX)	Kfwb.com
	KNX, 1070 AM	(323) 900-2070 (NEWSLINE)	https://www.facebook.com/KNX1070/ Knx1070.com
Television	KCBS – News	(818) 655-2000	-
	KNBC – News	(818) 684-4321	-
	KABC – Eyewitness News	(818) 863-7777	-
Newspapers	San Gabriel Valley Daily Tribune	626-598-8826	605 E Huntington Dr Ste 100 Monrovia, California 91016
	Daily Bulletin	(909) 987-6397	-
	Los Angeles Times	(213) 237-5000 (800) LATIMES (213) 237-3535 (FAX)	latimes.com

Section 9 - Recovery Period

After an emergency incident, the recovery phase is put into place in order to return the system back to normal operations.

Recovery Activities

During the recovery period, the following actions should be taken:

- Disaster Recovery Coordinator should document emergency work performed and submit appropriate documents for reimbursement under existing legislation
- Make detailed damage inspection of system
- Notify key personnel (including regulatory and health agencies)
- Complete emergency repairs and schedule permanent repairs
- Un-tag repaired facilities and equipment
- Replace used materials and supplies
- Complete permanent repairs and replacements

Reimbursement After Emergencies

After a major disaster is proclaimed, state and federal funding may become available.

To ensure receiving maximum reimbursement, the agencies designated coordinator must maintain detailed records of all measures taken to protect against disasters, all restoration work done with the location and number of hours worked, number of persons employed, and the cost of all equipment and supplies used.



WWW.CIVILTEC.COM

Civil, Water, Wastewater, Drainage, Transportation and Electrical/Controls Engineering. Construction Management and Surveying

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

D

2025 RUWMP Part 4

City of Pomona

Appendix D

D1: UWMP Compliance Checklist

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Part 2 Chapter 4 Part 1 Chapter 3
x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Part 2 Chapter 4 Executive Summary
x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Part 2 Chapter 4
x	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Part 2 Chapter 4 Section 2.1
x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Part 2 Chapter 4
x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Part 2 Chapter 4
x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Part 2 Chapter 4 Section 9 Part 4 Appendix D-2
x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Part 4 Appendix D-2
x	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Part 1 Chapter 5
n/a	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	n/a
x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Part 2 Chapter 4 Section 1.1
x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Part 2 Chapter 4 Section 1.1
x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Part 2 Chapter 4 Section 1.1
x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Part 2 Chapter 4 Section 1.1
x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Part 2 Chapter 4 Section 1.1
x	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Part 2 Chapter 4 Section 2
x	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Part 2 Chapter 4 Section 2.1.3
x	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Part 2 Chapter 4 Section 2.1.3
x	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Part 2 Chapter 4 Section 2.3
x	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Part 2 Chapter 4 Section 2.2

x	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Part 2 Chapter 4 Section 2.2
x	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Part 2 Chapter 4 Section 2
x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Part 2 Chapter 4 Section 2.4 Part 1 Chapter 5
n/a	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	n/a
x	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Part 2 Chapter 4 Section 3
x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Part 2 Chapter 4 Section 4 Part 1 Chapter 3
x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Part 2 Chapter 4 Section 4 Part 2 Chapter 4 Section 5.3 Part 1 Chapter 5 Section 2
x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Part 2 Chapter 4 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Part 2 Chapter 4 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Part 2 Chapter 4 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Part 2 Chapter 4 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Part 2 Chapter 4 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Part 2 Chapter 4 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Part 2 Chapter 4 Section 4.2

x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Part 2 Chapter 4 Section 4.8
x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Part 2 Chapter 4 Section 4.8 Part 1 Chapter 3 Part 1 Chapter 5
x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Part 2 Chapter 4 Section 4.6
x	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Part 2 Chapter 4 Section 4.5
x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Part 2 Chapter 4 Section 4.5
x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Part 2 Chapter 4 Section 4.5.1
x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Part 2 Chapter 4 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Part 2 Chapter 4 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Part 1 Chapter Section 5
x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Part 1 Chapter 3 Section 8
x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Part 2 Chapter 1 Section 4.7 Part 1 Chapter 3 Section 9
x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Part 2 Chapter 4 Section 4.9 Part 4 Appendix D
x	7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Part 2 Chapter 4 Section 5 Part 1 Chapter 3
x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Part 2 Chapter 4 Section 5.3 Part 1 Chapter 5 Section 2
x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Part 1 Chapter 3
x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Part 2 Chapter 4 Section 2.4 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Part 2 Chapter 4 Section 6 Part 1 Chapter 5

x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Part 2 Chapter 4 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Part 2 Chapter 4 Section 5.1 Part 1 Chapter 5
x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Part 4 Appendix D-7
x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Part 4 Appendix D-7
x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Part 4 Appendix D-7
x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Part 4 Appendix D-7
x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Part 4 Appendix D-7
x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Part 4 Appendix D-7
x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Part 4 Appendix D-7
x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies*.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Part 4 Appendix D-7

x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought*.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Part 4 Appendix D-7
x	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Part 2 Chapter 4 Section 8
n/a	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	n/a
x	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9
x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Part 2 Chapter 4 Section 9 Part 4 Appendix D-2
x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9
x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix D-3
x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Part 4 Appendix D-3
x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix D-3
x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9
x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9
x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9

x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9
x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9
x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9
x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 4 Section 9

D2: Public Outreach

D2: Attachment 1 – 60 Day Notices

Document is available online. Select the link below to view:

Show published document.

D2: Attachment 2 – Regional Workshop #1 Materials

Document is available online. Select the link below to view:

Show published document.

D2: Attachment 3 – Regional Workshop #2 Materials

Document is available online. Select the link below to view:

Show published document.

D3: Adoption Resolution

RESOLUTION NO. 2026-48

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA, CALIFORNIA, APPROVING THE CITY OF POMONA'S 2025 URBAN WATER MANAGEMENT PLAN: PART 1, PART 2 CHAPTER 4, PART 3, AND PART 4 APPENDIX D

WHEREAS, Article 3 of the California Urban Water Management Planning Act (Act) requires every urban water supplier prepare and adopt an Urban Water Management Plan (UWMP);

WHEREAS, the City Council desires to comply with the Act, which requires an update of the plan once every five (5) years;

WHEREAS, prior to approving its UWMP, the City must conduct a public hearing, noticed in accordance with California Government Code Section 6066;

WHEREAS, on March 18, 2026, a notice was sent to cities, the county, and water agencies that utilize Pomona water that the 2025 UWMP update was being prepared; and a Public Hearing for the 2025 UWMP was scheduled for May 18, 2026;

WHEREAS, a copy of the draft 2025 UWMP update was placed on file in the City Clerk's Office for public review;

WHEREAS, pursuant to California Water Code Section 10642, the notice of the Public Hearing was published in the Inland Valley Daily Bulletin on May 4, 2026, and May 11, 2026; and

WHEREAS, the City Council has conducted a duly noticed public hearing in accordance with the provisions set forth in Article 3 of the Act; and wishes to adopt the 2025 UWMP update.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. The City Council hereby accepts and approves Part 1, Part 2 Chapter 4, Part 3, and Part 4 Appendix D within the attached UWMP (Exhibit A).

SECTION 2. Upon the passage of this resolution, City staff is hereby directed send a copy of this resolution and the City's approved 2025 UWMP to the State Water Resources Control Board.

SECTION 3. The City Clerk shall attest and certify to the passage and adoption of this resolution and it shall become effective upon its approval.

PASSED, APPROVED AND ADOPTED this 18th day of May 2026.

CITY OF POMONA:

Tim Sandoval
Mayor

APPROVED AS TO FORM:

Sonia Carvalho
City Attorney

ATTEST:

Karla Shipman, CMC
Acting City Clerk

I, HEREBY CERTIFY that the foregoing resolution was duly adopted by the City Council of the City of Pomona at a regular meeting thereof held on May 18, 2026 by the following vote of the Council:

AYES:	Preciado, Ontiveros-Cole, Lustro, Canales, Sandoval
NOES:	None
ABSTAIN:	None
ABSENT:	Martin, Garcia

Diana Robles, CMC
Deputy City Clerk

EXHIBIT A
City of Pomona
2025 Urban Water Management Plan
(Attached herewith and incorporated herein by reference)

D4: Ordinances

The following ordinance is available online. Select the link below to view Ordinance No. 4122.

D5: DWR Tables

Submittal Table 2-1 Retail: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
CA1910126	City of Pomona	31,056	18,298
	Total	**31,056**	**18,298**

Submittal Table 2-2: Plan Identification

Type of Plan	Name of Regional Alliance or RUWMP
Individual UWMP	Three Valleys Regional Urban Water Management Plan

Submittal Table 2-3: Supplier Identification

Type of Supplier	Year Type	Month and date that the year begins (mm/dd)	Units of measure used in UWMP
Supplier is a retail supplier	Calendar Year	01/01	AF

Submittal Table 2-4 Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use.
Wholesale Water Supplier Name
Three Valleys Municipal Water District

Submittal Table 3-1 Retail: Population - Current and Projected

Category	2025	2030	2035	2040	2045	2050*(opt)*
Population Served	155,836	158,803	161,770	163,270	164,770	166,270

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual

Use Type	Additional Description (as needed)	2025 Actual Water Use Potable or Non-Potable	2025 Actual Water Use Volume (AF)
Single Family		Potable	8,160
Multi-Family		Potable	3,557
Commercial		Potable	3,223
Institutional		Potable	1,187
Landscape		Potable	1,392
Distribution System Water Loss		Potable	779
		Subtotal Potable	18,298
		Subtotal Non-Potable	1,849
		Total	**20,147**

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected

Use Type	Additional Description	Projected Water Use Potable or Non-Potable (Optional)	Projected Water Use 2030 (AF)	Projected Water Use 2035 (AF)	Projected Water Use 2040 (AF)	Projected Water Use 2045 (AF)	Projected Water Use 2050 opt (AF)
Single Family		Potable	8,178	8,164	8,075	7,986	7,897
Multi-Family		Potable	3,529	3,523	3,484	3,446	3,408
Commercial		Potable	3,062	3,057	3,024	2,991	2,957
Institutional		Potable	1,100	1,098	1,086	1,074	1,063
Landscape		Potable	1,248	1,245	1,232	1,218	1,205
Distribution System Water Losses		Potable	1,157	1,155	1,143	1,130	1,117
Subtotal Potable			18,273	18,242	18,043	17,845	17,647
Subtotal Non-Potable			1,874	1,874	1,874	1,874	1,874
Total			**20,147**	**20,116**	**19,917**	**19,719**	**19,521**

Submittal Table 4-3 Retail: Inclusion in Water Use Projections

Projection Item	Included in Projections?
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included In Projections?	Yes

Submittal Table 4-5 Retail: Water Loss Audit Reporting

Public Water System ID #	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910126	2020	Yes
CA1910126	2021	Yes
CA1910126	2022	Yes
CA1910126	2023	Yes
CA1910126	2024	Yes

Notes: The "Volume of Water Loss" quantities for CY 2020 through CY 2024 were obtained from the annual AWWA Water Loss Audits (and based on the combination of apparent losses and real losses). The AWWA Water Loss Audits were reported on a calendar year basis.

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard

Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System?	Real Water Loss State Water Board Standard 2028 Real Water Loss Standard per Unit per day	Real Water Loss State Water Board Standard Units for Real Water Loss	Real Water Loss Most Recent AWWA Water Loss Audit Number of Units (Connections or Miles corresponding with units selected)	Real Water Loss Most Recent AWWA Water Loss Audit Volume of Total Real Loss (AF) (from AWWA Water Loss Audit)	Real Water Loss Per Unit per Day	Apparent Water Loss State Water Board Standard 2028 Apparent Water Loss Standard per Unit per Day	Apparent Water Loss State Water Board Standard Units for Apparent Water Loss	Apparent Water Loss Most Recent AWWA Water Loss Audit Number of Connections	Apparent Water Loss Most Recent AWWA Water Loss Audit Volume of Total Apparent Loss (AF) (from AWWA Water Loss Audit)	Apparent Water Loss Per Unit per Day
CA1910126	Yes	21.7	Gallons per Service Connection per Day (GPSCD)	30,796	493	14.3	13.1	Gallons per Service Connection per Day (GPSCD)	30,796	923	26.8

Water Board's Calculated Water Loss Standards

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress

Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target?	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Actual 2025 GPCD (From SB X7-7 Compliance Form) *	Did Supplier meet the 2020 Target in 2025? *
n/a	n/a	147	113	Yes	105	Yes

Notes: n/a=Not Applicable

***** Only for suppliers that did not meet the Target in 2020

Submittal Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type	Potable or Non-Potable (OPTIONAL)	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Alluvial Basin	Potable	Chino Basin	9,182	10,159	10,189	10,449	9,796
Alluvial Basin	Potable	Six Basins	3,447	3,120	2,075	3,066	3,792
		Total	**12,629**	**13,279**	**12,264**	**13,515**	**13,588**

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area

Wastewater Collection Name of Wastewater Collection Agency	Wastewater Collection Wastewater Volume Metered or Estimated? Optional	Wastewater Collection Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Recipient of Collected Wastewater Name of Wastewater Treatment Plant (WWTP) and Place ID Number	Recipient of Collected Wastewater Is WWTP Located Within UWMP Area?
Sanitation Districts of Los Angeles County	Metered	7,672	Pomona Water Reclamation Plant, Place ID 250700	Yes
Total Wastewater Received from UWMP Service Area in 2025:		**7,672**		

Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (Optional)	2025 Volume of Wastewater Received from UWMP Service Area (AF)	Total 2025 Volume of Water Treated (AF)	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Treatment Level	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Volume (AF)	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Treatment Level	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Treatment Level	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Name of other entity
Pomona Water Reclamation Plant, Place ID 250700	Yes	7,672	4,987	Tertiary	1,423		3,564							
Total		**7,672**	**4,987**		**1,423**		**3,564**		**0**		**0**		**0**	

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

Use Type	Potable or Non-Potable (after treatment if treated) (Optional)	Additional Information	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use Volume	Potential Recycled Water Use Narrative page number (Optional)
Landscape irrigation (exc golf courses)	Non-Potable	Agricultural and landscape irrigation, ornamental plant irrigation, impoundment, and athletic field irrigation	1,423	1,874	1,874	1,874	1,874	1,874		
		Subtotal Potable	0	0	0	0	0	0	0	
		Subtotal Non-Potable	1,423	1,874	1,874	1,874	1,874	1,874	0	
		Total	**1,423**	**1,874**	**1,874**	**1,874**	**1,874**	**1,874**	**0**	**0**

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual

Use Type	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Landscape irrigation (exc golf courses)	2,350	1,423
Total	**2,350**	**1,423**

Notes:

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
Recycled Water Master Plan	Potential recycled water demands identified in City of Pomona's 2009 Water Master Plan	Future	
Draft Water, Sewer and Recycled Water Strategic Plan	Implement recommendations from Water, Sewer and Recycled Water Strategic Plan	Future	
		Total (AF)	**0**
		Unit Conversion to AF	**0**

Notes: A narrative explanation is provided in Section 4.5.1 of the UWMP.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other suppliers?	If Yes, Supplier Name	Additional Description	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AF)
Pomona Combined Project	No		Implement groundwater quality improvement measures, including Anion Exchange Plant and enhancements to Reservoir 5		Ongoing	Average Year	5,300

Notes: There are future water supply projects or programs not compatible with this table; therefore, are described in narrative form in Section 4.7 of the UWMP**.**

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Description	2025 Potable or Non-Potable (after treatment if treated) (Optional)	2025 Actual Volume (AF)	2025 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Chino Basin	9,796	Potable	
Groundwater (not desalinated)	Six Basins	3,792	Potable	
Surface Water	San Antonio Creek	1,683	Potable	
Recycled Water	Pomona Water Reclamation Plant	1,849	Non-Potable	
Purchased or Imported Water	Metropolitan Water District – TVMWD	3,027	Potable	
		Subtotal Potable	18,298	0
		Subtotal Non-Potable	1,849	0
		Total	**20,147**	**0**

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Projected Water Supply 2030 Reasonably Available Volume (AF)	Projected Water Supply 2030 Total Entitlement (AF) (Optional)	Projected Water Supply 2035 Reasonably Available Volume (AF)	Projected Water Supply 2035 Total Entitlement (AF) (Optional)	Projected Water Supply 2040 Reasonably Available Volume (AF)	Projected Water Supply 2040 Total Entitlement (AF) (Optional)	Projected Water Supply 2045 Reasonably Available Volume (AF)	Projected Water Supply 2045 Total Entitlement (AF) (Optional)	Projected Water Supply 2050 Reasonably Available Volume (AF)	Projected Water Supply 2050 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Chino Basin	Potable	10,050		9,970		9,800		9,555		9,239	
Groundwater (not desalinated)	Six Basins	Potable	3,216		3,190		3,136		3,057		2,956	
Surface Water	San Antonio Creek	Potable	1,691		1,674		1,649		1,616		1,576	
Recycled Water	Pomona Water Reclamation Plant	Non-Potable	1,874		1,874		1,874		1,874		1,874	
Purchased or Imported Water	Metropolitan Water District – Three Valleys Municipal Water District	Potable	3,315		3,408		3,458		3,617		3,876	
		Subtotal Potable	18,273	0	18,242	0	18,043	0	17,845	0	17,647	0
		Subtotal Non-Potable	1,874		1,874		1,874		1,874		1,874	0
		Total	**20,147**	**0**	**20,116**	**0**	**19,917**	**0**	**19,719**	**0**	**19,521**	**0**

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year	Volume Available (AF)	Percent of Average Supply
Average Year	2021-2025	20,327	100%
Single-Dry Year	2021	22,029	108%
Consecutive Dry Years 1st Year	2018	21,276	105%
Consecutive Dry Years 2nd Year	2019	19,782	97%
Consecutive Dry Years 3rd Year	2020	21,174	104%
Consecutive Dry Years 4th Year	2021	22,029	108%
Consecutive Dry Years 5th Year	2022	20,981	103%

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	20,147	20,116	19,917	19,719	19,521
Use totals	20,147	20,116	19,917	19,719	19,521
Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-5 (DWR Submittal Table 6-9R).

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	21,834	21,801	21,585	21,370	21,156
Use totals	21,834	21,801	21,585	21,370	21,156
Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-5 (DWR Submittal Table 6-9R).

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison

Year	Total Type / Difference	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	21,087	21,055	20,847	20,640	20,432
	Use totals	21,087	21,055	20,847	20,640	20,432
	Difference	0	0	0	0	0
Second year	Supply totals	19,607	19,577	19,383	19,190	18,998
	Use totals	19,607	19,577	19,383	19,190	18,998
	Difference	0	0	0	0	0
Third year	Supply totals	20,986	20,954	20,747	20,541	20,334
	Use totals	20,986	20,954	20,747	20,541	20,334
	Difference	0	0	0	0	0
Fourth year	Supply totals	21,834	21,801	21,585	21,370	21,156
	Use totals	21,834	21,801	21,585	21,370	21,156
	Difference	0	0	0	0	0
Fifth year	Supply totals	20,795	20,763	20,558	20,353	20,149
	Use totals	20,795	20,763	20,558	20,353	20,149
	Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-5 (DWR Submittal Table 6-9R).

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment

Totals	2026	2027	2028	2029	2030
Total Water Use (AF)	21,087	19,607	20,986	21,834	20,795
Total Supplies (AF)	21,087	19,607	20,986	21,834	20,795
Difference w/o WSCP Action (AF)	**0**	**0**	**0**	**0**	**0**

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		

Notes: The Supplier uses the standard six levels of water shortage; therefore, supplier-specific shortage levels and percentage ranges are not separately identified in this table.

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (Percentage)	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)
1	Transfers		Not applicable (see notes)	
2	Transfers		Not applicable (see notes)	
3	Transfers		Not applicable (see notes)	
4	Transfers		Not applicable (see notes)	
5	Transfers		Not applicable (see notes)	
6	Transfers		Not applicable (see notes)	

Notes: The City will consider increased production from Six Basins and the Chino Basin using existing facilities to address increased demands. As noted in Submittal Table 8-3 and Table 2 of the WSCP (Part 4 Appendix D7), the City plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

Submittal Table 8-3 Retail: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	No excessive runoff.	Yes
1	Landscape - Prohibit certain types of landscape irrigation	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	No watering/irrigating for more than 15 min/day/station.	Yes
1	CII - Lodging establishment must offer opt out of linen service	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY		Yes
1	CII - Commercial kitchens required to use pre-rinse spray valves	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY		Yes
1	Water Features - Restrict water use for decorative water features, such as fountains	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Water features must operate with recirculated water.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Other - Prohibit use of potable water for washing hard surfaces	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Exceptions for hand-held bucket or similar container or a hand- held hose equipped with a positive self-closing water shut-off nozzle or device	Yes
1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Exceptions for hand-held bucket or similar container or a hand- held hose equipped with a positive self-closing water shut-off nozzle or device	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Must be repaired within 72 hours of notification.	Yes
1	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Maximum 3 days a week.	Yes
1	Increase Frequency of Meter Reading	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Per evaluation of annual water loss audits.	No
1	Implement or Modify Drought Rate Structure or Surcharge	Volume	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	At the sole discretion of City Council.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
2	Other	Volume	Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 3,627 AFY	All actions under Shortage Level 1	Yes
2	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Maximum 2 days a week.	Yes
2	Other water feature or swimming pool restriction	Volume	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Filling ornamental, lakes, ponds, pools, or spas is prohibited.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Must be repaired within 48 hours of notification.	Yes
3	Other	Volume	Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 5,441 AFY	All actions under Shortage Level 2	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
4	Other	Volume	Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 7,254 AFY	All actions under Shortage Level 3	Yes
4	Moratorium or Net Zero Demand Increase on New Connections	Volume	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY	The City may decide not to provide new service or discontinue water service.	Yes
4	Landscape - Prohibit all landscape irrigation	Volume	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY		Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY	Must be repaired within 24 hours of notification.	Yes
5	Other	Volume	Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 9,068 AFY	All actions under Shortage Level 4	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
6	Other	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 9,068 AFY	All actions under Shortage Level 5	Yes

Submittal Table 10-1 Retail: Notification to Cities and Counties

City or County Name	60 Day Notice	Notice of Public Hearing
Claremont	Yes	Yes
Pomona	Yes	Yes
Upland	Yes	Yes
Los Angeles County	Yes	Yes

D6: AWWA Water Audits

The following AWWA Water Audit reports are available online. Select the links below to view each report:

- 2020 AWWA Water Audit
- 2021 AWWA Water Audit
- 2022 AWWA Water Audit
- 2023 AWWA Water Audit
- 2024 AWWA Water Audit

If a link is not available, AWWA Water Audit reports for all years can be downloaded from the WUEdata website.

D7: Water Shortage Contingency Plan

D7: Attachment 1 – Water Shortage Contingency Plan Adoption Resolution

RESOLUTION NO. 2026-49

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA, CALIFORNIA, APPROVING THE CITY OF POMONA'S 2025 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, Article 3 of the California Urban Water Management Planning Act (Act) requires every urban water supplier prepare and adopt an Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP);

WHEREAS, compliance with the Act, which requires an update of the plan once every five (5) years;

WHEREAS, prior to approving its WSCP, the City must conduct a public hearing, noticed in accordance with California Government Code Section 6066;

WHEREAS, on March 18, 2026, a notice was sent to cities, the county, and water agencies that utilize Pomona water that the 2025 UWMP/WSCP was reviewed and updated where needed; and a Public Hearing for the 2025 WSCP was scheduled for May 18, 2026;

WHEREAS, a copy of the 2025 UWMP and WSCP update was placed on file in the City Clerk's Office for public review;

WHEREAS, pursuant to California Water Code Section 10642, the notice of the Public Hearing was published in the Inland Valley Daily Bulletin on May 4, 2026 and May 11, 2026; and

WHEREAS, the City Council has conducted a duly noticed public hearing in accordance with the provisions set forth in Article 3 of the Act; and wishes to adopt the 2025 Water Shortage Contingency Plan.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. The City Council hereby accepts and approves the attached 2025 Water Shortage Contingency Plan (Exhibit A).

SECTION 2. Upon the passage of this resolution, City staff is hereby directed to send a copy of this resolution and the City's approved 2025 WSCP to the State Water Resources Control Board.

SECTION 3. The City Clerk shall attest and certify to the passage and adoption of this resolution and it shall become effective upon its approval.

PASSED, APPROVED AND ADOPTED this 18th day of May 2026.

CITY OF POMONA:

Tim Sandoval
Mayor

APPROVED AS TO FORM:

Sonia Carvalho
City Attorney

ATTEST:

Karla Shipman
Acting City Clerk

I, HEREBY CERTIFY that the foregoing resolution was duly adopted by the City Council of the City of Pomona at a regular meeting thereof held on May 18, 2026 by the following vote of the Council:

AYES:	Preciado, Ontiveros-Cole, Lustro, Canales, Sandoval
NOES:	None
ABSTAIN:	None
ABSENT:	Martin, Garcia

Diana Robles, CMC
Deputy City Clerk

EXHIBIT A
City of Pomona
Water Shortage Contingency Plan
(Attached herewith and incorporated herein by reference)

D7: Attachment 2 – Water Shortage Contingency Plan

2025 WATER SHORTAGE CONTINGENCY PLAN

CITY OF POMONA

ACRONYMS AND ABBREVIATIONS

Acronym	Description
AF	Acre-Foot
AFY	Acre-Feet per Year
CII	Commercial, Industrial, and Institutional
City	City of Pomona
CWC	California Water Code
DMM	Demand Management Measure
DWR	California Department of Water Resources
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
IEUA	Inland Empire Utilities Agency
LACSD	Los Angeles County Sanitation Districts
MWD	Metropolitan Water District of Southern California
RRA	Risk and Resilience Assessment
SWP	State Water Project
TVMWD	Three Valleys Municipal Water District
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan

WATER SHORTAGE CONTINGENCY PLAN

LAY DESCRIPTION

WATER SHORTAGE CONTINGENCY PLAN

The City of Pomona's (City) Water Shortage Contingency Plan (WSCP) discusses and provides the following:

- The City's WSCP is a detailed approach which presents how the City intends to act, or respond, in the case of an actual water shortage contingency.
- Preparation of the City's "Annual Water Supply and Demand Assessment" (Annual Assessment) is discussed. Beginning July 1, 2022, the City has submitted the Annual Assessment every year through 2025. The Annual Assessment includes a review of the City's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent the City's water demands prior to any "response actions" the City may invoke pursuant to the City's WSCP.
- The City will manage water supplies to minimize the adverse impacts of water shortages. The City's plan for water usage during periods of shortage is designed to incorporate six standard water shortage levels including up to 10, 20, 30, 40, and 50 percent shortages, and greater than a 50 percent shortage.
- For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level.

- For each declared water supply shortage level, the City has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.
- The operational changes the City will consider in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- The City's Emergency Response Plan (ERP) is summarized. The ERP provides the management, procedures, and designated actions the City and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of the City's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of the City's water service area are provided.
- The effectiveness of the shortage response actions for each of the City's standard water shortage levels is presented. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands.
- The communication protocols implemented by the City when it declares any water shortage level are presented.
- The compliance and enforcement procedures associated with City's standard water shortage levels are presented.
- The legal authorities associated with City's standard water shortage levels are presented.
- The financial consequences associated with City's standard water shortage levels are presented.
- The City will evaluate the need for revising the WSCP in order to resolve any water shortage gaps, as necessary. The steps necessary for the City to adopt and amend its WSCP are presented.

The following WSCP includes references to Chapters and Sections from the City's 2025 Urban Water Management Plan (UWMP):

1 WATER SUPPLY RELIABILITY ANALYSIS

CWC 10632.

(a)(1) The analysis of water supply reliability conducted pursuant to Section 10635.

The City's sources of supply were discussed in Chapter 4 of the 2025 UWMP and consist of groundwater from Six Basins, groundwater from Chino Basin, groundwater from Spadra Basin, treated surface water from San Antonio Creek, treated imported water purchased from Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD), and recycled water purchased from the Los Angeles County Sanitation Districts (LACSD). The City provides recycled water for irrigation in lieu of potable water supplies. Both Six Basins and Chino Basin are adjudicated, and groundwater supplies are managed. The reliability of the various sources of supply is discussed in Chapter 5 of the 2025 UWMP. Based on the adjudication provisions in the two groundwater basins, the City is able to produce groundwater without limitation, provided an applicable assessment is paid to the respective Watermaster service to purchase untreated imported water for groundwater replenishment. Imported water supplies (both treated and untreated) may be impacted in the event MWD implements its Water Supply Allocation Plan (WSAP) due to a water supply shortage. Finally, recycled water is locally generated and is not impacted by drought conditions.

2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

CWC 10632.

(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

CWC 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

Beginning July 1, 2022, the City has submitted an Annual Assessment in accordance with Department of Water Resources' (DWR) guidance and requirements. The Annual Assessment includes a review of the City's unconstrained water demands (i.e. water demands prior to any projected response actions the City may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. The City also includes information regarding anticipated shortages, triggered shortage response actions,

compliance and enforcement actions, and communication actions consistent with the City's WSCP.

For each Annual Assessment, the City prepares a preliminary assessment which evaluates the adequacy of its water supplies for the current and upcoming years by April of each year. The preliminary assessment includes a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

2.1 DECISION MAKING PROCESS

The City produces groundwater from the Chino Basin, Spadra Basin, and Six Basins as its primary sources of water supply and these basins are managed on a fiscal year (FY) basis. Consequently, during the third quarter of each fiscal year, the City reviews its water demands from the initial six months along with the current groundwater basin conditions and local hydrology. This information is used to help develop the Annual Assessment. The City compares total demand to total supply to identify potential shortages. If shortages are identified, the City will determine the necessary WSCP level and corresponding reduction. A draft of the Annual Assessment is circulated internally within the City for peer review and comment. Based on comments received, a redraft is prepared and provided to City managers during the Spring of each year. The draft is subsequently provided to the City Manager for final review. Subsequently, a final draft of the Annual Assessment is provided to the City Council for review and included in the agenda as part of a City Council meeting such that it can be approved, and any recommended specific shortage response actions may be enacted. The final Annual Assessment is provided to DWR no later than July 1 of each year.

The Annual Assessment is instrumental in providing guidance to the City for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency

and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process ensures adequate water supply resources are available to the City.

2.2 DATA AND METHODOLOGIES

The key data inputs and methodologies that are evaluated by the City during the preparation of the preliminary assessment will include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment are identified. The evaluation criteria includes, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels), current water demands, a review of water system improvement plans which may impact infrastructure availability, and water quality regulations which may impact groundwater availability.

2) Water Supply: A description of each available water supply source is provided. The descriptions includes a quantification of each available water supply source and are based on review of current production capacities, historical production, UWMPs, and prior water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, are reviewed. The review includes factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban Water Supplier Reports, existing water shortage levels (see Section 3), and existing water conservation ordinances (see Section 8.1.1 of the UWMP).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands during the current year and the upcoming (potential single dry) year are considered and identified for each source of supply. The evaluation includes factors such as estimated water demands, weather,

groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.

5) Infrastructure Considerations: The capabilities of the water distribution system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year are considered. Available production capacities (e.g. groundwater well capacities) and distribution system water losses (see Section 2.1.2 of the UWMP) are reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see Section 4.7 of the UWMP), will be considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies are described.

3 SIX STANDARD WATER SHORTAGE LEVELS

CWC 10632.

(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.
(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross reference relating its existing categories to the six standard water shortage levels.

The City will manage water supplies to prudently minimize the adverse impacts of water shortages. The City's plan for water usage during periods of shortage is designed to incorporate six standard water shortage levels corresponding to progressive ranges from up to a 10, 20, 30, 40, and 50 percent shortages, and greater than a 50 percent shortage.

For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level. The required percentage reduction for each customer will be based on water usage during the same billing period in the last calendar year during which there were no declared water shortages.

The City's Ordinance No. 4122 ("Water Conservation and Water Supply Shortage Program and Regulations"), adopted in June 2009, previously established three (3) water shortage levels. A copy of Ordinance No. 4122 is provided in Appendix A. In accordance with the CWC in which urban water suppliers are required to define six standard water shortage levels, the City has developed the crosswalk illustrated below that translates the City's previously established shortage levels to the mandated standard shortage levels. The shortage level changes were made in 2020 and have remained the same for 2025.

Corresponding Relationships Between Supplier's 2015 Shortage Levels and the 2020 WSCP Mandated Shortage Levels

Established Level	Supply Condition/ Shortage
1	10%
2	11 to 30%
3	> 30%

2020 Standard Level	Shortage Level
1	≤10%
2	10 to 20%
3	20 to 30%
4	30 to 40%
5	40 to 50%
6	> 50%

Note: The 2020 shortage levels have remained the same for 2025.

Table 1 provides a description of the six standard water shortage levels which may be triggered by a shortage in one or more of the City's water supply sources, depending on the severity of the shortage and its anticipated duration.

Table 1. Water Shortage Contingency Planning Levels

Submittal Table 8-1 Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions** (*Narrative description*)
1	Up to 10%	Watering or irrigating is limited to a maximum of 3 days per week during April through October and a maximum of 1 day per week during November through March. All leaks, breaks, or other malfunctions must be repaired within 72 hours. In addition, actions include implementation of other prohibitions, restrictions, or operational changes on water use as determined by the City. These actions include, but are not limited to, an increase in the water rate structure and increased performance of customer water loss audits.
2	Up to 20%	In addition to Shortage Level 1, actions include increased limitation on watering or irrigating; all leaks, breaks, or other malfunctions must be repaired within 48 hours; Limits on filling ornamental lakes, washing vehicles, and filling residential swimming pools and spas.
3	Up to 30%	In addition to Shortage Level 2, actions include implementation of other prohibitions, restrictions, or operational changes on water use as determined by the City. These actions include, but are not limited to, an increase in the water rate structure and increased performance of customer water loss audits.
4	Up to 40%	In addition to Shortage Level 3, actions include restrictions on watering or irrigating and all leaks, breaks, or other malfunctions must be repaired within 24 hours. The City in its sole discretion may decide not to provide new potable water service or may discontinue service.
5	Up to 50%	In addition to Shortage Level 4, actions include implementation of other prohibitions, restrictions, or operational changes on water use as determined by the City. These actions include, but are not limited to, an increase in the water rate structure and increased performance of customer water loss audits.
6	>50%	In addition to Shortage Level 5, actions include implementation of other prohibitions, restrictions, or operational changes on water use as determined by the City. These actions include, but are not limited to, an increase in the water rate structure and increased performance of customer water loss audits.

Notes

4 SHORTAGE RESPONSE ACTIONS

CWC 10632.

(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

Shortage response actions are dependent on the severity of a declared shortage level. Response actions implement varying improvements and regulations of system infrastructure and operations, water supply augmentation, demand reduction initiatives and other water use functions to conserve water supplies.

4.1 DEMAND REDUCTION

The City has established water shortage response actions to reduce demand on water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions. Depending on the percent reduction in the City's water supply and corresponding water shortage level, regulations have been made to conserve water and reduce the shortage gap in normal supply levels. Many demand reduction actions are applicable to all levels of water shortages while others are exclusive to certain levels of shortage. The structure of demand reduction actions under a specific water shortage level are designed to encourage those customers with high gallon per capita usage to achieve proportionally greater reduction than those with low use. Violations of these demand reduction actions may be considered waste and an unreasonable use of water. Table 2 describes each demand reduction action and its effect on reducing the shortage gap.

The following demand reduction actions are applicable to all water shortage levels and are in effect at all times:

- Watering or irrigating of any lawn, landscape, or other vegetated area in a manner that causes or allows excessive water runoff onto an adjoining sidewalk, driveway, street, alley gutter, or ditch is prohibited.
- Watering or irrigating of lawn, landscape, or other vegetated area with potable water using a landscape irrigation system or a watering device, that is not continuously attended, is limited to no more than 15 minutes watering per day per station. This does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour and weather-based controllers or stream rotor sprinklers that meet a 70 percent efficiency standard. Operating a water fountain or other decorative water feature that does not use recirculated water is prohibited.
- Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios, or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, or a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.
- Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat, motor home, or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or at a commercial car washing facility that utilizes a recirculating water system. Installation of non-recirculating water systems is prohibited in new commercial conveyor car wash, new commercial laundry systems, or new other water intensive operations as determined by the City.
- Commercial lodging establishments must provide customers with an optional daily towel and linen laundering service. Commercial lodging establishments must prominently display notice of this option in each bathroom. Contingent on available

funding and materials as determined by the City in its sole discretion, the City will annually provide display materials to establishments for notice on these items.

- Food preparation establishments are prohibited from using non-water conserving dish wash spray valves.
- Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, club, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

Water Supply Shortage Level 1:

- Limits on Watering Days: Watering or irrigating of lawn, landscape, or other vegetated area with potable water during the months of April through October is limited to three days per week on a schedule established by the City. (By way of example - Odd addresses on Monday, Wednesday, and Friday; even addresses on Tuesday, Thursday, and Saturday.) During the months of November through March, watering or irrigating of lawn, landscape, or other vegetated area with potable water is limited to no more than one day per week on a schedule established and noticed by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday.) This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
- Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the City unless other arrangements are made with the City.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable

notice to customers. This includes an increase in the conservation rate structure and increased performance of water loss audits.

Water Supply Shortage Level 2:

In addition to the restrictions identified in Water Supply Shortage Level 1, the following additional water conservation requirements apply:

- Limits on Watering Days: Watering or irrigating of lawn, landscape, or other vegetated area with potable water during the months of April through October is limited to two days per week on a schedule established by the City. (By way of example - Odd addresses on Monday and Thursday, even addresses on Tuesday and Friday). During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday). This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.
- Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the City unless other arrangements are made with the City.
- Limits on Filling Ornamental Lakes or Ponds: Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a standard Water Shortage Level 2.
- Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat, motor home, or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket

or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a recirculating water system to capture or reuse water.

- Limits on Filling Residential Swimming Pools and Spas: Refilling of more than one foot per week, and initial filling of residential swimming pools or outdoor spas with potable water is prohibited, except upon written authorization from the City Manager or designee.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased performance of water loss audits.

Water Supply Shortage Level 3:

In addition to the restrictions identified in Water Supply Shortage Level 2, the following additional water conservation requirements apply:

- Limits on Watering Days: Watering or irrigating of lawn, landscape, or other vegetated area with potable water during the months of April through October is limited to two days per week on a schedule established by the City. (By way of example - Odd addresses on Monday and Thursday, even addresses on Tuesday and Friday). During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday). This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

- Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the City unless other arrangements are made with the City.
- Limits on Filling Ornamental Lakes or Ponds: Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a standard Water Shortage Level 3.
- Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat, motor home, or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a recirculating water system to capture or reuse water.
- Limits on Filling Residential Swimming Pools and Spas: Refilling of more than one foot per week, and initial filling of residential swimming pools or outdoor spas with potable water is prohibited, except upon written authorization from the City Manager or designee.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions, or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased performance of water loss audits.

Water Supply Shortage Level 4:

In addition to the restrictions identified in Water Supply Shortage Level 3, the following additional water conservation requirements apply:

- No Watering or Irrigating: Watering or irrigating of lawn, landscape, or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:

a) Maintenance of vegetation excluding turf, but including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two gallons of water per hour subject to the watering hour restrictions;
b) Maintenance of existing landscape necessary for fire protection;
c) Maintenance of existing landscape for soil erosion control;
d) Maintenance of plant materials identified to be rare or essential to the wellbeing of rare animals;
e) Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two days per week according to the established watering schedule and time restrictions;

- Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within 24 hours of notification by the City unless other arrangements are made with the City.
- New Potable Water Service: The City, dependent on an analysis of water supply, may decide not to (a) provide new potable water service; (b) provide new temporary meters or permanent meters, and (c) issue any statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability), except under the following circumstances:

a) A valid, unexpired building permit has been issued for the project; or
b) The project is necessary to protect the public's health, safety, and welfare; or
c) The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less, or as determined by the City Manager or designee.

- Discontinue Service: The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this WSCP.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased water loss audits.

Water Supply Shortage Level 5:

In addition to the restrictions identified in Water Supply Shortage Level 4, the City may implement further and more restrictive water conservation measures under Water Supply Shortage Level 5. The following additional water conservation requirements apply:

- No Watering or Irrigating: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:
    a) Maintenance of vegetation excluding turf, but including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two gallons of water per hour subject to the watering hour restrictions;
    b) Maintenance of existing landscape necessary for fire protection;
    c) Maintenance of existing landscape for soil erosion control;
    d) Maintenance of plant materials identified to be rare or essential to the wellbeing of rare animals;
    e) Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two days per week according to the established watering schedule and time restrictions;

- Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within 24 hours of notification by the City unless other arrangements are made with the City.

- New Potable Water Service: The City, dependent on an analysis of water supply, may decide not to (a) provide new potable water service; (b) provide new temporary meters or permanent meters, and (c) issue any statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability), except under the following circumstances:
    a) A valid, unexpired building permit has been issued for the project; or
    b) The project is necessary to protect the public's health, safety, and welfare; or
    c) The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

  This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less, or as determined by the City Manager or designee.
- Discontinue Service: The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this WSCP.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased water loss audits.

<u>Water Supply Shortage Level 6:</u>

In addition to the restrictions identified in Water Supply Shortage Level 5, the City may implement further and more restrictive water conservation measures under Water Supply Shortage Level 6. The following additional water conservation requirements apply:

- No Watering or Irrigating: Watering or irrigating of lawn, landscape, or other vegetated area with potable water is prohibited. This restriction does not apply to

the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:

a) Maintenance of vegetation excluding turf, but including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two gallons of water per hour subject to the watering hour restrictions;
b) Maintenance of existing landscape necessary for fire protection;
c) Maintenance of existing landscape for soil erosion control;
d) Maintenance of plant materials identified to be rare or essential to the wellbeing of rare animals;
e) Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two days per week according to the established watering schedule and time restrictions;

- Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing or distribution system must be repaired within 24 hours of notification by the City unless other arrangements are made with the City.

- New Potable Water Service: The City, dependent on an analysis of water supply, may decide not to (a) provide new potable water service; (b) provide new temporary meters or permanent meters, and (c) issue any statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability), except under the following circumstances:

a) A valid, unexpired building permit has been issued for the project; or
b) The project is necessary to protect the public's health, safety, and welfare; or
c) The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less, or as determined by the City Manager or designee.

- Discontinue Service: The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this WSCP.
- Other Prohibited Uses: The City may implement other prohibitions, restrictions or operational changes on water uses as determined by the City, upon reasonable notice to customers. This includes an increase in the conservation rate structure and increased water loss audits.

Table 2. Demand Reduction Actions

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	No excessive runoff.	Yes
1	Landscape - Prohibit certain types of landscape irrigation	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	No watering/irrigating for more than 15 min/day/station.	Yes
1	CII - Lodging establishment must offer opt out of linen service	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY		Yes
1	CII - Commercial kitchens required to use pre-rinse spray valves	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY		Yes
1	Water Features - Restrict water use for decorative water features, such as fountains	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Water features must operate with recirculated water.	Yes
1	Other - Prohibit use of potable water for washing hard surfaces	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Exceptions for hand-held bucket or similar container or a hand- held hose equipped with a positive self-closing water shut-off nozzle or device	Yes
1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Exceptions for hand-held bucket or similar container or a hand- held hose equipped with a positive self-closing water shut-off nozzle or device	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Must be repaired within 72 hours of notification.	Yes
1	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Maximum 3 days a week.	Yes
1	Increase Frequency of Meter Reading	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	Per evaluation of annual water loss audits.	No
1	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 1 actions is up to 1,814 AFY	At the sole discretion of City Council.	Yes
2	Other	Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 3,627 AFY	All actions under Shortage Level 1	Yes
2	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Maximum 2 days a week.	Yes
2	Other water feature or swimming pool restriction	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Filling ornamental, lakes, ponds, pools, or spas is prohibited.	Yes

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 2 actions is up to 3,627 AFY	Must be repaired within 48 hours of notification.	Yes
3	Other	Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 5,441 AFY	All actions under Shortage Level 2	Yes
4	Other	Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 7,254 AFY	All actions under Shortage Level 3	Yes
4	Moratorium or Net Zero Demand Increase on New Connections	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY	The City may decide not to provide new service or discontinue water service.	Yes
4	Landscape - Prohibit all landscape irrigation	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY		Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 4 actions is up to 7,254 AFY	Must be repaired within 24 hours of notification.	Yes
5	Other	Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 9,068 AFY	All actions under Shortage Level 4	Yes
6	Other	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 9,068 AFY	All actions under Shortage Level 5	Yes

Notes:

4.2 SUPPLY AUGMENTATION

The City does not plan to add a new source of water supply to address customer demands but instead will consider increased supplies from existing sources. Table 3 reflects this approach and does not identify any new supplies. Instead, the City will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. As discussed in Chapter 4 of the UWMP, the City's sources of water supply include groundwater produced from the Chino Basin, Spadra Basin, and Six Basins, treated imported water purchased from MWD through TVMWD, and recycled water supplies provided by LACSD. As noted in Section 2, beginning July 1, 2022, the City has prepared and submitted an Annual Assessment which includes a review of water supplies available to meet water demands for the current and upcoming years. In the event the City is currently in, or considers entering into, one of the standard water shortage levels identified in Section 3, the City will consider the water supply (augmentation) actions described below.

For each water shortage level discussed in Section 3, the City will consider supplementing its existing treated imported water supplies through increased production of groundwater supplies, to the extent possible. Due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies,

including TVMWD. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its Municipal and Industrial (M&I) retail demand. The ratio of MWD water supply drought allocation to local water supply will change based on the WSAP stage. The MWD drought allocation can be used to make Full Service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any Full Service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

In addition to the WSAP, MWD describes supply augmentation actions in its Regional 2025 UWMP, which is incorporated by reference. MWD's primary response to any gap between core supplies (from the State Water Project (SWP) and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million AF. Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and on-going water supply and storage programs and management practices, the City will use up to the treated imported water supply made available from MWD through TVMWD in association with each of the standard water shortage levels identified in Section 3. Water demands will be addressed through increased use of the local groundwater supplies and implementation of demand reduction measures through the various stages of action.

The City has the flexibility to augment its existing water supplies through production of groundwater from the Six Basins and Chino Basin. The Six Basins is managed by the Six Basins Watermaster, and the Chino Basin is managed by the Chino Basin Watermaster. During the periods of management under the Six Basin Judgment and the Chino Basin

Judgment, significant drought events have occurred. In each drought cycle, both the Six Basins and the Chino Basin have been managed to maintain water levels. Parties to the Six Basins Basin Judgment and Chino Basin Judgment, including the City, are authorized to produce groundwater in excess of their rights and pay assessments for such production to the respective Watermaster. The assessments are used to purchase untreated imported water to replenish the Six Basins and Chino Basin. The Six Basins Watermaster purchases untreated imported water to replenish the Six Basins from MWD through TVMWD. The Chino Basin Watermaster purchases untreated imported water to replenish the Chino Basin from MWD through Inland Empire Utilities Agency (IEUA). In addition, groundwater quality in the Six Basins and the Chino Basin is not expected to impact potable supplies or constrain supply reliability. Groundwater quality is carefully monitored and managed by the Watermaster for each respective basin. In addition, Treatment facilities and/or blend plans have been developed by water agencies to meet potable water standards and to prevent the spread of any groundwater contamination. Based on historical and on-going management practices, the City will be able to continue relying on the Six Basins and Chino Basin for adequate supplies in response to each of the standard water shortage levels identified in Section 3. An additional potential source of replenishment water is recycled water.

Table 3. Supply Augmentation and Other Actions

Submittal Table 8-2: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Transfers	Not applicable (see Notes)	
2	Transfers	Not applicable (see Notes)	
3	Transfers	Not applicable (see Notes)	
4	Transfers	Not applicable (see Notes)	
5	Transfers	Not applicable (see Notes)	
6	Transfers	Not applicable (see Notes)	

NOTES: The City will consider increased production from Six Basins and the Chino Basin using existing facilities to address increased demands. As noted on Table 2, the City plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

4.3 OPERATIONAL CHANGES

During a water supply shortage situation, the City will manage its water supply resources to provide sufficient water supplies capable of meeting the demands of its customers. Section 4.2 describes the City's water supply sources and water supply augmentation actions available. Section 4.2 describes the City's standard water shortage levels and associated demand reduction measures. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in short-term operational changes which are necessary to allow the City to utilize all available water supply sources in response to water shortage situations.

As noted in Section 2, beginning July 1, 2022, the City has prepared and submitted an Annual Assessment which includes a review of the water supplies available to meet water demands for the current and upcoming years. Preparation of the Annual Assessment assists the City in determining any potential operational changes. In addition, the City's standard water shortage levels and the associated demand reduction measures, in conjunction with the City's existing Demand Management Measures (DMM) (discussed in Chapter 8 of the UWMP), will be essential to the City in reducing water demands during any water shortage period. The operational changes the City will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- Optimized production from existing available water supply sources.
- Potential use of emergency supply sources, including emergency interconnections.
- Potential blending of water supply resources.
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses.

4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by the City to reduce customer demands are discussed in Section 4.2. There are no additional mandatory restrictions planned at this time.

4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in the City's standard water shortage levels (identified in Section 3) and the associated demand reduction measures (described in Section 4.1). In addition to the water supply augmentation actions (Section 4.2) and potential operational changes (Section 4.3) which the City may consider in order to continue providing sufficient water supplies, the City will review and implement any necessary steps included in its ERP.

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including the City, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated ERP every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States Environment Protection Agency (USEPA), confirming the current RRA and ERP have been reviewed and updated. For the City, the RRA certification was due by March 31, 2025, and the ERP certification was due by September 30, 2025.

The City's RRA evaluates the vulnerabilities, threats, and consequences from potential hazards to the City's water system. The City prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and

- Operation and maintenance.

The City's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with the City's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

The City's ERP provides the management, procedures, and designated actions the City and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances. The City's ERP (which is incorporated by reference) provides guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies which directly affect the water system and the ability to maintain safe operations (such as chlorine release, and earthquake, or a threat of contamination). The ERP also incorporates the results of the City's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity;
- Plans and procedures for responding to a natural hazard or malevolent act;
- Actions and equipment to lessen the impact of a natural hazard or malevolent act; and
- Strategies to detect natural hazards or malevolent act.

The City will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. The City will also review applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC 10632.5.

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

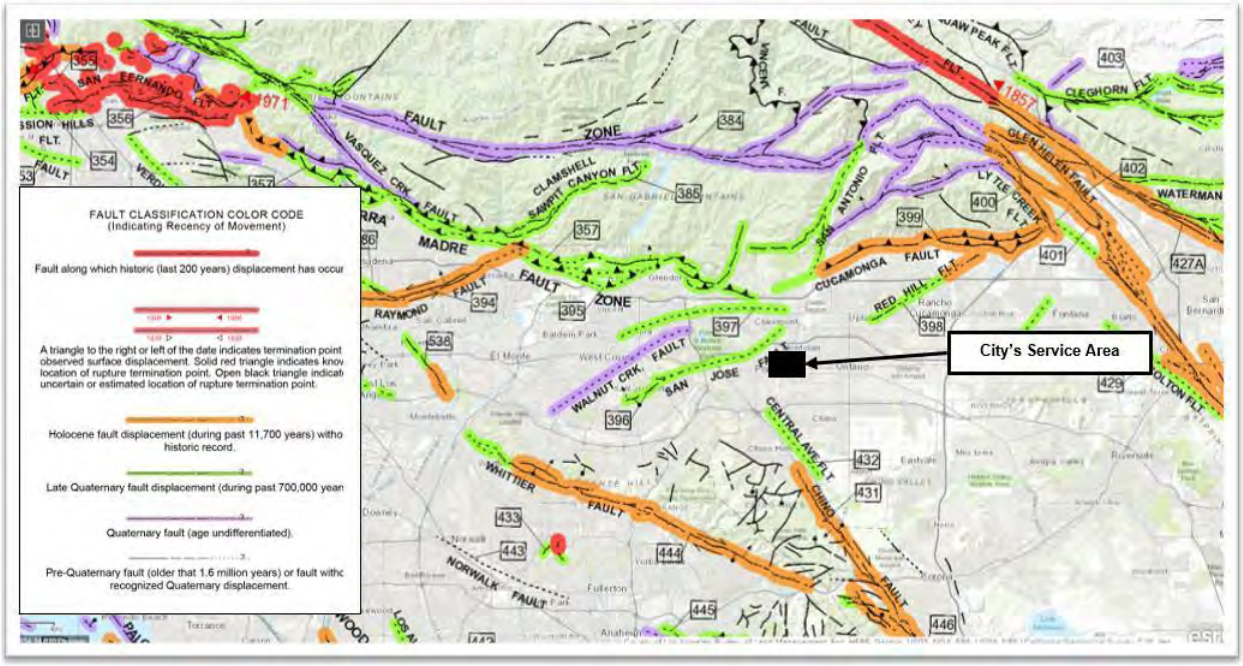
The City prepared a local "Natural Hazards Mitigation Plan Update" which was approved by the Federal Emergency Management Agency (FEMA) in 2022. The "Natural Hazards Mitigation Plan Update" identifies effective ways to assess the significant natural hazards (including earthquakes) that may affect the City and its residents. The "Natural Hazards Mitigation Plan Update" provides resources, information, and strategies to reduce the City's vulnerability to these hazards, while providing guidance for the coordination of mitigation activities throughout the City. The "Natural Hazards Mitigation Plan Update" includes mitigation projects necessary to reduce seismic risk to the City's water distribution system facilities (including its distribution system pipelines, groundwater wells, booster pumps, and storage reservoirs) and potential disruptions in providing water service. The City's "Natural Hazards Mitigation Plan Update" is provided in Appendix B.

The County of Los Angeles prepared an "All-Hazards Mitigation Plan" in 2025 which identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Los Angeles County, and the mitigation strategies necessary to reduce risks, including seismic risk. The County's All-Hazards Mitigation Plan is provided in Appendix C.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater

than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of the City's water service area are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in the City's water service area include the San Andreas fault, the Whittier fault, the San Jose fault, the Chino fault, the Central Avenue fault, and the Sierra Madre fault.

Location of Earthquake Faults

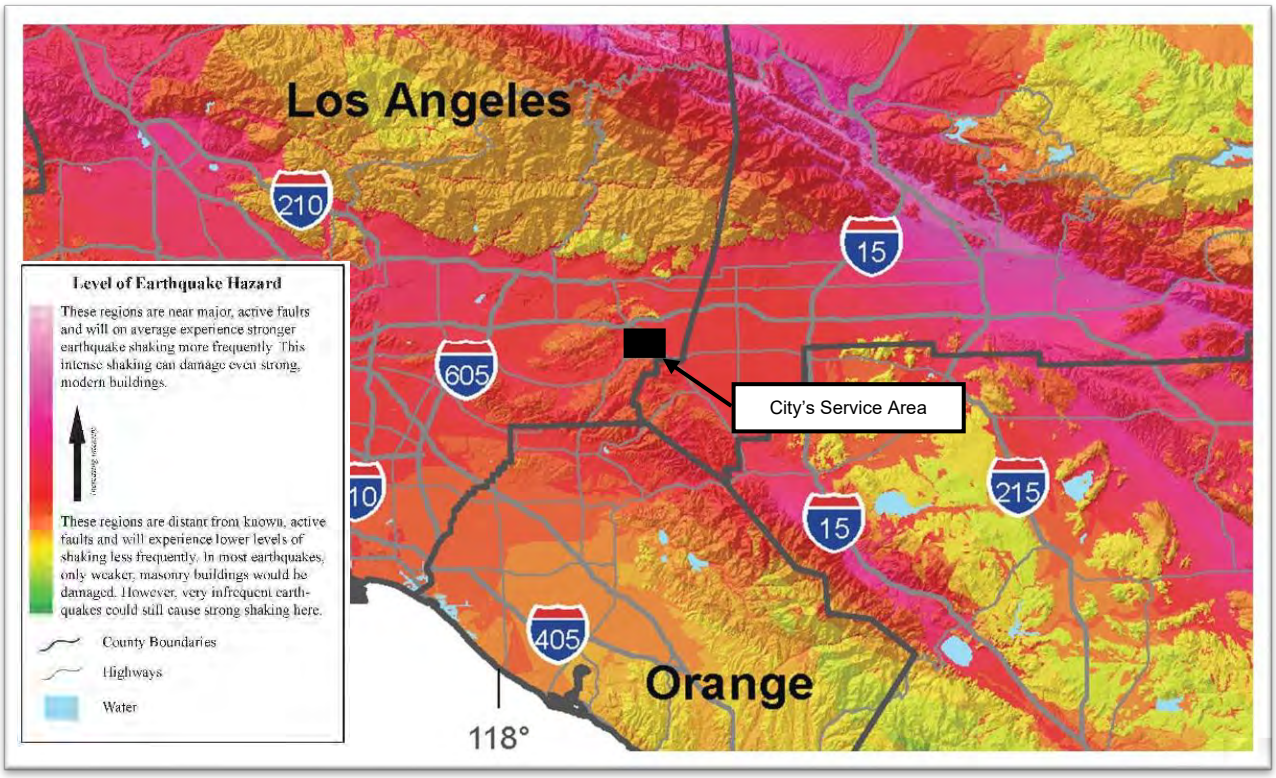


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of the City's service area from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including the City's service area, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 4.5, the City has prepared an ERP which provides the management, procedures, and designated actions the City and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers

receive a reliable and adequate supply of potable water. The City's ERP is incorporated by reference.

Earthquake Shaking Potential



Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 3 is evident in the City's historical ability to meet its customer's water demands in response to a water supply shortage. In addition, the City imposes water consumption regulations and restrictions and supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of the City's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3.

During the past five years, the City experienced a consecutive two-year drought within its service area from FY 2021 to FY 2022. Throughout this extended dry year period, the

City's annual water production averaged 21,505 acre-feet per year (AFY). During the past five years, the average annual production was approximately 19,881 AFY, with a maximum of up to 22,029 AF during FY 2021. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, the City has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

The City's water demands during the most recent five years averaged approximately 17,168 AFY of potable water. Due to conservation efforts and demand management measures (discussed in Chapter 8 of the UWMP), the City's recent water demands have been less than its historical water demands, including during long-term droughts. The City's projected water demands (during a normal year, a single dry year, and a five consecutive year drought conditions) are provided in Section 5.3 of the UWMP and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. It is anticipated the City will be able to continue providing sufficient water supplies to its customers to meet projected water demands, including during long-term droughts. In addition, as discussed in Section 4.2, based on historical and on-going management practices, the City will be able to continue relying on its water supply sources from the Chino Basin, Spadra Basin, and Six Basins for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 3.

The City previously adopted Resolution No. 2015-41 in May 2015 which declared a water supply shortage and established water-use restrictions and regulations equivalent to the standard water shortage level 2 identified in Section 3. During this Level 2 water shortage period, the City was able to reduce water demands by up to 20 percent and provide sufficient water supplies to its customers. Subsequently, the City adopted Resolution No. 2016-105 in July 2016 which rescinded the Level 2 water supply shortage and declared a water supply shortage equivalent to standard water shortage Level 1. During this Level 1 water shortage period, the City was able to reduce water demand by up to 10 percent and

provide sufficient water supplies to its customers. Copies of the resolutions are provided in Appendix A.

Based on the City's demonstrated ability to meet water demands during past water supply shortages, the adopted water shortage levels, the adjusted operating safe yields, and water supplies through long-term droughts, it is anticipated that the City will be able to provide sufficient water supplies to its customers during each of its standard water shortage levels. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. The City will enact varying levels of its WSCP to encourage retail customers to reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of the City's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction section provided in Table 2 and Table 3. The effectiveness of the City's shortage response actions are based on the City's water demands prior to 2015 (unconstrained demands). The City reduced its water demands in 2015 in response to the Governor's April 1, 2015, Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. The City's actual water demand reduction during this period was used to estimate the extent of water use reductions for the City's Water Shortage Stages. The City's Water Shortage Levels 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

5 COMMUNICATION PROTOCOLS

CWC 10632.

(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

The City utilizes established communication protocols and procedures to inform customers, the general public, interested parties, and local agencies of current or anticipated water shortages, shortage response actions, and other relevant information.

Beginning July 1, 2022, the City has submitted an Annual Assessment in accordance with DWR's guidance and requirements. The Annual Assessment includes a review of the City's unconstrained water demands (i.e. water demands prior to any projected response actions the City may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. The City will also include information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the City's WSCP. See Section 2 for more information regarding the Annual Assessment.

Standard water shortage levels may be declared by resolution of the City Council, adopted at a regular or special public meeting held in accordance with state law. The mandatory conservation requirements applicable to the shortage level conditions will take effect on the 10th day after the date the shortage level is declared. Within seven days following the declaration of the shortage level, the City must publish a copy of the resolution in a newspaper used for publication of official notices. If the City establishes a water allocation, it must provide notice of the allocation by including it in the regular billing statement. A water allocation will be effective on the 5th day following the date of mailing or at such later date as specified in the notice. The City may declare an end to any water shortage level upon recommendation by the City Manager, or designee, and resolution by the City Council at any regular or special meeting of the City Council.

Under unique circumstances where a specific requirement of this WSCP would result in undue hardship to a customer that is disproportionate to the impacts on other customers, the customer may apply for a waiver pursuant to the requirements as provided in this WSCP. The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to the customer. The customer must provide the following documents for review:

(1) The application for a waiver prescribed by the City and accompanied by a non-refundable processing fee in an amount set by City Council resolution.

(2) Photographs, maps, drawings, and other information, including a written statement of the applicant.

An application for a waiver will be denied unless the City finds, based on the information provided in the application, supporting documents, or such additional information that may be requested, and on water use information for the property as shown by the records of the City or its agent, all of the following:

(1) That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other customers;

(2) That, because of special circumstances applicable to the property or its use, the strict application of this division would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

(3) That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the City to effectuate the purpose of this division and will not be detrimental to the public interest; and

(4) That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent, or general in nature.

The City Manager or designee must act upon any completed application no later than ten business days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the City Manager, or designee, shall be final.

6 COMPLIANCE AND ENFORCEMENT

CWC 10632.

(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

Any violation of this WSCP is considered a waste and an unreasonable use of water. The City will track violations by analyzing the City water loss audits for potential leak locations and by documenting correspondence of the City Water Watcher Reporting Line, a 24- Hour Service where customers can report witnessing the abuse of water supplies.

Any violation of this WSCP may be prosecuted as a misdemeanor or as an infraction, at the discretion of the City, pursuant to Article X of the Pomona Municipal Code (Code). Pursuant to Section 1-7 of this Code, a misdemeanor is punishable by imprisonment in the county jail for no more than 30 days, or by a fine not exceeding $1,000.00, or by both.

The City Manager and respective departments shall have the authority to administer and enforce this division.

Pursuant to this WSCP, penalties for failure to comply with any provisions of the WSCP are as follows:

(1) A fine not exceeding $100.00 for a first violation.

(2) A fine not exceeding $200.00 for a second violation of the same provision within one year.

(3) A fine not exceeding $500.00 for each additional violation of the same provision within one year.

a. *Water flow restrictor:* In addition to any fines, the City may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of 48 hours.

b. *Termination of service:* In addition to any fines and the installation of a water flow restrictor, the City may disconnect and/or terminate a customer's water service.

A person or entity that violates this division is responsible for payment of the City's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the City's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device must be paid to the City before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

Pursuant to this WSCP, each day that a violation of this ordinance occurs is a separate offense.

The City will issue a notice of violation by mail or personal delivery at least ten days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the violation by filing a written notice of appeal pursuant to this WSCP.

Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the City may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water shortage level condition.

7 LEGAL AUTHORITIES

CWC 10632.

(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

CWC Division 1, Section 350

The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

The City is responsible for implementing and enforcing the water shortage response actions described in Section 4. This WSCP is subject to any changes deemed necessary by the City.

The City Manager, or designee, may declare a water shortage emergency and may immediately enact the mandatory requirements of any of the levels designated herein. The required measures of the designated water shortage level will be effective immediately and will be communicated to the public. The emergency implementation will be ratified by resolution of the City Council at its next meeting.

The City shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency. This includes the Cities of Chino Hills, Claremont, La Verne, and Montclair, and the County of Los Angeles.

The City shall declare a water shortage emergency in accordance with CA Water Code CHAPTER 3 - Water Shortage Emergencies § 350 – 358. Legal authorities include California Water Code Sections 71640-71644 Article 3. Water Shortages and CA Water Code § 366 (2025) CHAPTER 3.3 - Excessive Residential Water Use During Drought.

8 FINANCIAL CONSEQUENCES OF WSCP

CWC 10632.

(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

To ensure compliance with CWC Chapter 3.3 (commencing with Section 365), additional costs may be incurred to monitor and enforce WSCP actions. These costs may vary depending on the applicable water shortage stage and the duration of the water shortage emergency.

The City's primary source of revenue is user service charges, which consists of bimonthly fixed readiness-to-serve charges according to meter size and a volumetric charge per unit of water consumed. The bimonthly fixed readiness-to-serve charges are sufficient to meet about 45 percent of the City's operations and maintenance expenses. The revenue from the consumption charge is designed to be sufficient to fund the remaining 55 percent of the operations and maintenance expenses plus all of the variable expenses associated with the cost of water. The current water rates are provided in Appendix D.

The City Council may adopt resolutions to make additional adjustments to the water rates based on the City's increased costs to provide water for its customers.

The City has historically maintained a financial reserve in its Water Fund. The City may use financial reserves for water system expenditures to make up for shortfalls in water revenue associated with unanticipated reduced water sales.

9 MONITORING AND REPORTING

CWC 10632.

(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

Customer compliance with the provisions adopted by declaration of a WSCP are monitored and reported through water loss audits performed by the City's Water Resource Department. Staff prepare annual Distribution System Water Audits to monitor water

losses. Staff review the audits to track real and apparent losses. Losses are monitored by comparing water production to sales. The City regularly monitors its system and repairs leaks in a timely manner. To help in its effort to reduce and eliminate losses, the City has purchased various sound correlators for identifying system leaks. In those areas where a leak is visible, staff are dispatched to a site to pinpoint the leak to minimize the excavation area and save resources.

The City's Water Resources Department is also the first point of contact of the City Water Watcher Reporting Line, a 24-Hour Service where customers can report witness of abuse of water supplies. Reports are documented for record of offenses and necessary penalties.

10 WSCP REFINEMENT PROCEDURES

CWC 10632.

(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

The City's WSCP has been prepared as an adaptive management plan. As discussed in Section 9, the City will monitor and report on the implementation of the WSCP. The City will review the implementation results for any current or potential shortage gaps between water supplies and demands. The City will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. The City will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 8 of the UWMP).
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 4.2).
- Implementation of stricter enforcement actions and penalties (discussed in Section 6).

- Improvements to the water supply augmentation responses (discussed in Section 4.2), as well as any associated operational changes (discussed in Section 4.3) which may be required.
- Incorporation of additional actions recommended by City staff or other interested parties.

The City will use the monitoring and reporting data to evaluate the ability for these potential revisions to resolve any shortage gaps which may occur within the standard water shortage levels.

This WSCP is adopted as part of the City's 2025 UWMP adoption process discussed in Section 9.2 of the UWMP. It is anticipated the City will review, revise, and adopt an updated WSCP as part of preparing its 2031 UWMP, as necessary. However, the City will continue to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to the City's WSCP will include a public hearing and adoption process by City Council (see Section 12).

11 SPECIAL WATER FEATURE DISTINCTION

CWC 10632.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

The City's WSCP defines "decorative water features" as water features which are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water features. As a result, the City's WSCP has reviewed the response actions, enforcement actions, and monitoring and reporting programs separately for decorative water features and for pools and spas, as applicable.

Please see Section 4.1. for specific demand reduction actions in relation to special water features.

12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

CWC 10632.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

CWC 10635.

(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

The City's WSCP is adopted as part of the City's 2025 UWMP adoption process discussed in Chapter 9 of the UWMP. The process for adopting the City's WSCP includes the following:

- The City will conduct a public hearing and make the WSCP available for public inspection.
- The City will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- The City will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- The City Council will adopt the 2025 UWMP and the WSCP.
- As part of submitting the 2025 UWMP to DWR, the City will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2026. The City will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, the City will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

The City will conduct a public hearing and make the amended WSCP available for public inspection.

- The City Council will adopt the amended WSCP.
- The City will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.
- Within 30 days after submission of the WSCP to DWR, the City will provide the WSCP to any city or county within which the City provides water.

Additional information regarding the adoption, submittal, and availability of the City's WSCP (and 2025 UWMP) is provided in Chapter 9 of the UWMP.

APPENDIX A

CITY OF POMONA ORDINANCE AND RESOLUTIONS

ORDINANCE NO. 4122

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF POMONA AMENDING CHAPTER 62 ("UTILITIES") OF THE POMONA CITY CODE TO ESTABLISH A WATER CONSERVATION AND WATER SUPPLY SHORTAGE PROGRAM AND REGULATIONS

WHEREAS, from time to time, drought conditions in the State of California have resulted in reduced water supply to the Pomona Valley;

WHEREAS, the water supply from outside sources such as the Bay-Delta Region, the Eastern Sierras, and the Colorado River has become uncertain and unreliable;

WHEREAS, on February 27, 2009, Governor Arnold Schwarzenegger proclaimed a statewide emergency due to the drought resulting from a combination of worsening water supply conditions;

WHEREAS, a reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the City of Pomona (the "City");

WHEREAS, careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs;

WHEREAS, currently Chapter 62, Article IV, Division 4 of the Pomona City Code details a water conservation program;

WHEREAS, in order to meet the water needs of City residents and businesses, and the needs of customers of the City's water utility, and to protect the public from the potential health hazards posed by a drought, the City must impose a stricter, more comprehensive water conservation program; and

WHEREAS, pursuant to California Water Code Section 375 *et seq.*, the City Council desires to adopt and enforce the following water conservation program to reduce water consumption and conserve supplies, and to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Pomona as follows:

SECTION 1. That Division of Article IV of Chapter 62 of the Pomona City Code is hereby repealed and replaced with the following:

Division 4. "Water Conservation and Water Supply Shortage Program."

Section 62-351. Title

This division shall be known as the City of Pomona Water Conservation and Water Supply Shortage Program.

Section 62-352. Definitions

The following words and phrases whenever used in this division shall have the meaning defined in this section:

(1) "City" means the City of Pomona.

(2) "Person" means any natural person or persons, corporation, public or private entity, governmental agency or institution, or any other user of water provided by the City.

(3) "Landscape Irrigation System" means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand, or through an automated system.

(4) "Large Landscape Areas" means a lawn, landscape, or other vegetated area, or combination thereof, equal to more than one (1) acre of irrigable land.

(5) "Single Pass Cooling Systems" means equipment where water is circulated only once to cool equipment before being disposed.

(6) "Potable Water" means water which is suitable for drinking.

(7) "Recycled Water" means the reclamation and reuse of non-potable water for beneficial use.

(8) "Billing Unit" means the unit of water used to apply water rates for purposes of calculating water charges for a person's water usage and equals one hundred (100) cubic feet or seven hundred forty-eight (748) gallons of water.

Section 62-353. Application

(a) The provisions of this division apply to any person, customer and property served by the City.

(b) The provisions of this division do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire, and other similar emergency services.

(c) The provisions of this division do not apply to the use of recycled water, with the exception of Section 62-354(a).

(d) The provisions of this division do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops, or other vegetation intended for commercial sale.

(e) Where any provision of the Pomona City Code is in conflict with any provision of this division, the provision of this division shall take precedence. This includes, but is

not limited to, Chapter 18, Article V (Landscape Maintenance) of this Code, and Section .600 (Exterior Property Maintenance) of the Pomona Zoning Ordinance.

(f) This division is intended solely to further the conservation of water. It is not intended to implement any provision of federal, state, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff.

Section 62-354. Permanent Water Conservation Requirements

The following water conservation requirements are effective at all times and are permanent. Violations of this section will be considered waste and an unreasonable use of water.

(a) *Limits on Watering Hours.* Watering or irrigating of lawn, landscape or other vegetated area with potable or recycled water is prohibited between the hours of 10 a.m. and 6 p.m. Pacific Standard Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting, or repairing an irrigation system.

(b) *Limit on Watering Duration.* Watering or irrigating of lawn, landscape, or other vegetated area with potable water using a landscape irrigation system or a watering device, that is not continuously attended, is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a seventy percent (70%) efficiency standard.

(c) *No Excessive Water Flow or Runoff.* Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter, or ditch is prohibited.

(d) *No Washing Down Hard or Paved Surfaces.* Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios, or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, or a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

(e) *Obligation to Fix Leaks, Breaks or Malfunctions.* Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than seven (7) days of receiving notice from the City, is prohibited. The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this subsection.

(f) *Re-circulating Water Required for Water Fountains and Decorative Water Features.* Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited, effective January 1, 2010.

(g) *Limits on Washing Vehicles.* Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat, motor home or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

(h) *Drinking Water Served Upon Request Only.* Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, club or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

(i) *Commercial Lodging Establishments Must Provide Option to Not Launder Linen Daily.* Hotels, motels and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language. Contingent on available funding and materials as determined by the City in its sole discretion, the City will annually provide display materials to establishments for notice on these items.

(j) *No Installation of Single Pass Cooling Systems.* Installation of single pass cooling systems is prohibited in buildings requesting new water service.

(k) *No Installation of Non re-circulating water systems in new Commercial Car Wash, new Laundry Systems, or other new water intensive operations as determined by the City.* Installation of non re-circulating water systems is prohibited in new commercial conveyor car wash, new commercial laundry systems, or new other water intensive operations as determined by the City.

(l) *Restaurants Required to Use Water Conserving Dish Wash Spray Valves.* Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

(m) *Commercial Car Wash Systems.* Effective January 1, 2011, all commercial conveyor car wash systems must have installed operational re-circulating water systems, or must have secured a waiver of this requirement from the City.

Section 62-355. Level 1 Water Supply Shortage

(a) A Level I water shortage may be declared by the City Manager, or designee, if any combination of events or factors threaten the adequacy of foreseeable water supply to customers. Qualifying factors to be considered in making a water shortage declaration

include, but are not limited to: time of year, local rainfall, Metropolitan Water District's / Three Valleys Municipal Water District's Water Supply Allocation Plans, State Water Project Allocations, Groundwater Conjunctive Use (Dry Year Yield) Program, Operating Safe Yield as determined by the respective Chino Basin or Six Basins Watermasters responsible for groundwater allocation in groundwater basins and any major operating emergencies, or natural disasters that cause damage to the water supply or water distribution system. Prior to making a public announcement of a Level I water shortage, the City Manager, or designee, shall document the basis for the water shortage declaration and communicate this information to the City Council. A Level 1 declaration will require a consumer demand reduction of up to 10% to make more efficient use of water and respond to existing water conditions.

(b) In addition to the prohibited uses of water identified in Section 62-354, the following water conservation requirements apply during a declared Level 1 Water Supply Shortage:

(1) *Limits on Watering Days.* Watering or irrigating of lawn, landscape or other vegetated area with potable water during the months of April through October is limited to three (3) days per week on a schedule established and posted/noticed by the City. (By way of example - Odd addresses on Monday, Wednesday, and Friday; even addresses on Tuesday, Thursday, and Saturday.) During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one (1) day per week on a schedule established and noticed by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday.) This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the City unless other arrangements are made with the City.

(3) *Other Prohibited Uses.* The City may implement other prohibitions on water uses as determined by the City, upon reasonable notice to customers.

Section 62-356. Level 2 Water Supply Shortage

(a) A Level 2 Water Supply Shortage exists when the City determines, in its sole discretion, that due to such factors as outlined in Section 62-355(a), a water supply shortage exists and a consumer demand reduction of eleven percent (11%) to thirty percent (30%) is necessary to make more efficient use of water and respond to existing water conditions. Upon the declaration by the City of a Level 2 Water Supply Shortage

pursuant to Section 62-358(a), the City will implement the mandatory Level 2 conservation measures identified in this section.

(b) In addition to the prohibited uses of water identified in Section 62-354, the following additional water conservation requirements apply during a declared Level 2 Water Supply Shortage:

(1) *Limits on Watering Days.* Watering or irrigating of lawn, landscape or other vegetated area with potable water during the months of April through October is limited to two (2) days per week on a schedule established and posted/noticed by the City. (By way of example - Odd addresses on Monday and Thursday, even addresses on Tuesday and Friday). During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one (1) day per week on a schedule established and posted/noticed by the City. (By way of example - Odd addresses on Tuesday, even addresses on Thursday). This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the City unless other arrangements are made with the City.

(3) *Limits on Filling Ornamental Lakes or Ponds.* Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this ordinance.

(4) *Limits on Washing Vehicles.* Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus motorcycle, boat, motor home or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

(5) *Limits on Filling Residential Swimming Pools & Spas.* Re-filling of more than one (1) foot per week, and initial filling of residential swimming pools or outdoor spas with potable water is prohibited, except upon written authorization from the City Manager or designee.

(6) *Other Prohibited Uses.* The City may implement other prohibitions on water uses as determined by the City, upon reasonable notice to customers.

Section 62-357. Level 3 Water Supply Emergency Shortage

(a) A Level 3 Water Supply Emergency Shortage exists when the City declares a water shortage emergency due to such factors as outlined in Section 62-355(a) and notifies its residents and businesses that a significant reduction in consumer demand of more than thirty percent (30%) is necessary to make more efficient use of water and respond to existing water conditions. Upon the declaration by the City of a Level 3 Water Supply Emergency Shortage pursuant to Section 62-358(b), the City will implement the mandatory Level 3 conservation measures identified in this section.

(b) In addition to the prohibited uses of water identified in Section 62-354, the following water conservation requirements apply upon the City's declaration of a Level 3 Water Supply Emergency Shortage:

(1) *No Watering or Irrigating.* Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:

i. Maintenance of vegetation excluding turf, but including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two (2) gallons of water per hour subject to the hour restrictions in Section 62-354(a);
ii. Maintenance of existing landscape necessary for fire protection;
iii. Maintenance of existing landscape for soil erosion control;
iv. Maintenance of plant materials identified to be rare or essential to the well being of rare animals;
v. Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Section 62-356(b)(1) and time restrictions in Section 62-354(a) and (b)(1);

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the City unless other arrangements are made with the City.

(3) *New Potable Water Service.* Pursuant to Section 356 of the California Water Code, the City, dependant on an analysis of water supply, may decide not to (a) provide new potable water service; (b) provide new temporary meters or permanent meters, and (c) issue any statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability), except under the following circumstances:

i. A valid, unexpired building permit has been issued for the project; or
ii. The project is necessary to protect the public's health, safety, and welfare; or
iii. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one (1) year or less, or as determined by City Manager or designee.

(4) *Discontinue Service.* Pursuant to Section 356 of the California Water Code, the City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this section.

Section 62-358. Declaration and Notification of Water Supply Shortage

(a) *Declaration and Notification of Levels 1 & 2 Water Supply Shortage.* The existence of Level 1 or Level 2 Water Supply Shortage conditions may be declared by resolution of the City adopted at a regular or special public meeting held in accordance with State law. The mandatory conservation requirements applicable to Level 1 or Level 2 conditions will take effect on the tenth (10th) day after the date the shortage level is declared. Within seven (7) days following the declaration of the shortage level, the City must publish a copy of the resolution in a newspaper used for publication of official notices. If the City establishes a water allocation, it must provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth (5th) day following the date of mailing or at such later date as specified in the notice.

(b) *Declaration and Notification of Level 3 Water Supply Shortage.* The existence of a Level 3 Water Supply Emergency Shortage may be declared by resolution in accordance with the procedures specified in Sections 351 and 352 of the Water Code. The mandatory conservation requirements applicable to the Level 3 conditions will take effect on the tenth (10th) day after the date the shortage level is declared. Within seven (7) days following the declaration of the shortage level, the City must publish a copy of the resolution in a newspaper used for the publication of official notices. If the City establishes a water allocation, it will provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth (5th) day following the date of mailing or at such later date as specified in the notice.

(c) *Declaration and Notification that the Water Supply Shortage Situation Has Ended.* The City of Pomona may declare an end to Water Supply Shortage Levels 1, 2 and 3, as well as any Water Watch voluntary compliance, upon recommendation by the

City Manager, or designee, and resolution by the City Council at any regular or special meeting of the City Council.

Section 62-359. Other Provisions

(a) *Commercial Car Wash Systems.* Effective on January 1, 2011, all commercial conveyor car wash systems must have installed operational re-circulating water systems, or must have secured a waiver of this requirement from the City.

(b) *Large Landscape Areas; Rain Sensors.* Large landscape areas, such as parks, cemeteries, golf courses, school grounds, and playing fields, that use landscape irrigation systems to water or irrigate, may be required to use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain or irrigation timers which automatically use information such as evapotranspiration sensors to set an efficient water use schedule.

(c) *Construction Purposes.* Recycled or non-potable water must be used for construction purposes when available.

(d) *No New Annexations.* Upon the declaration of a Level 3 Water Supply Shortage condition, the City will suspend consideration of annexations to its service area. This subsection does not apply to boundary corrections and annexations that will not result in any increased use of water.

(e) *Limits on Building Permits.* Based on the availability of the water supply, the City will administratively limit, or withhold the issuance of building permits, which require new or expanded water service, except to protect the public health, safety and welfare.

(f) *Water Recycling Required if Alternative Available.* The use of potable water, other than recycled water, is prohibited for specified uses after the City has provided to the customer an analysis showing that recycled water is a cost-effective alternative to potable water for such uses and the customer has had a reasonable time, as determined by the City Manager, to make the conversion to recycled water.

(g) *Water Recycling; New Service.* Prior to the connection of any new water service, an evaluation must be done by the City to determine whether recycled water exists to supply all or some of the water needed and recycled water must be utilized to the extent feasible.

(h) *Customer Water Conservation Reports.* The City may, by written request, require all commercial, residential and industrial customers using twenty five thousand (25,000) or more billing units per year to submit a water conservation plan and to submit quarterly progress reports on such plan. The conservation plan must include recommendations for increased water savings, including increased water recycling based on feasibility, and the reports must include progress to date on implementation of such recommendations.

(i) *Water Conserving Plumbing Standards*

(1) Retrofits Upon Sale or Transfer: It is strongly encouraged that structures sold or transferred meet current City and Plumbing codes for water-conserving plumbing fixtures.

(2) Change in Service: Upon the establishment of new water service or a change in water service from one person to another non-family member, the customer will be encouraged to retrofit plumbing fixtures with water-conserving plumbing fixtures.

(j) *Reporting Line.* The City will establish a water waste reporting line for residents to report violations of this division.

(k) *State Model Landscape Ordinance.* The City will utilize the Department of Water Resources State Model Landscaping Ordinance as a reference in the development of future revisions.

(l) *Restrictions and Rates.* The City Council may, in its sole discretion, adopt a resolution to impose additional restrictions or prohibitions on the use of water to achieve reductions, or make additional adjustments to the water rates, based on the City's increased costs to provide water to its customers.

(m) *Voluntary Compliance.* The City Manager, or designee, may recommend, and upon resolution of the City Council, declare a Water Watch condition when there is a reasonable probability that there will be a water supply shortage and that a consumer demand reduction of up to ten (10) percent is required in order to ensure sufficient supplies will be available to meet anticipated demands. Upon such declaration, the City Manager, or designee, shall take action to implement the conservation practices outlined in a Level 1 Water Supply Shortage, on a voluntary basis.

(n) *Emergency Implementation.* Pursuant to Water Code Section 351, should a failure in the water system occur causing an immediate emergency, the City Manager, or designee, may declare a need to immediately enact the mandatory requirements of any of the levels designated herein. The required measures of the designated shortage level will be effective immediately and will be communicated to the public. The emergency implementation will be ratified by resolution of the City Council at its next meeting.

Section 62-360. Hardship Waiver

(a) *Undue and Disproportionate Hardship.* If, due to unique circumstances, a specific requirement of this division would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver pursuant to the requirements as provided in this section.

(b) *Written Finding.* The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property.

(1) Application: Application for a waiver must be on a form prescribed by the City and accompanied by a non-refundable processing fee in an amount set by City Council resolution.

(2) Supporting Documentation: The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

(3) Required Findings for Waiver: An application for a waiver will be denied unless the City finds, based on the information provided in the application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the City or its Agent, all of the following:

i. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;

ii. That because of special circumstances applicable to the property or its use, the strict application of this division would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

iii. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the City to effectuate the purpose of this division and will not be detrimental to the public interest; and

iv. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

(4) Approval Authority: The City Manager or designee must act upon any completed application no later than ten (10) business days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the City Manager, or designee, shall be final.

Section 62-361. Penalties and Violations

(a) Any violation of this division may be prosecuted as a misdemeanor or as an infraction, at the discretion of the City, pursuant to Article X of this Code. Pursuant to Section 1-7 of this Code, a misdemeanor is punishable by imprisonment in the county jail

for not more than thirty (30) days, or by a fine not exceeding one thousand dollars ($1,000), or by both.

(b) The City Manager and respective departments shall have the authority to administer and enforce this division.

(c) Pursuant to Section 1-7(d) of this Code, penalties for failure to comply with any provisions of the ordinance are as follows:

(1) A fine not exceeding $100.00 for a first violation.

(2) A fine not exceeding $200.00 for a second violation of the same provision within one year.

(3) A fine not exceeding $500.00 for each additional violation of the same provision within one year.

i. Water Flow Restrictor: In addition to any fines, the City may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty eight (48) hours.

ii. Termination of Service: In addition to any fines and the installation of a water flow restrictor, the City may disconnect and/or terminate a customer's water service.

(d) A person or entity that violates this ordinance is responsible for payment of the City's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the City's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device must be paid to the City before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

(e) Pursuant to Section 1-7(f) of this Code, each day that a violation of this ordinance occurs is a separate offense.

(f) Notice and Hearing:

(1) The City will issue a Notice of Violation by mail or personal delivery at least ten (10) days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal, pursuant to Section 2-1188 et seq. of this Code.

(2) Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the City may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water Level condition.

SECTION 3. If any section, subsection, sentence, clause or phrase in this division is for any reason held invalid, the validity of the remainder of the division will not be affected. The City Council hereby declares it would have passed this division and each section, subsection,

sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or is declared invalid.

SECTION 4. The City Clerk shall attest to the adoption of this ordinance, causing it to be posted, and it shall be in full force immediately upon its adoption.

PASSED AND ADOPTED THIS 15th DAY OF JUNE 2009.

ATTEST

for Marie Michel Macias, City Clerk

CITY OF POMONA

Elliott Rothman, Mayor

APPROVED AS TO FORM

Arnold Alvarez-Glasman, City Attorney

STATE OF CALIFORNIA
COUNTY OF LOS ANGELES
CITY OF POMONA

I, MARIE MICHEL MACIAS, CITY CLERK of the City of Pomona do hereby certify that the foregoing Ordinance was introduced for first reading on the 1st day of June 2009 and adopted at second reading at a regular meeting of the City Council of the City of Pomona on the 15th day of June, 2009.

AYES: COUNCILMEMBERS: Soto, Rodriguez, Carrizosa, Lantz, Saunders, Atchley, Rothman
NOES: COUNCILMEMBERS: None
ABSENT: COUNCILMEMBERS: None
ABSTAIN: COUNCILMEMBERS: None

for Marie Michel Macias, City Clerk

RESOLUTION NO. 2015-41

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA, CALIFORNIA, DECLARING A LEVEL 2 WATER SUPPLY SHORTAGE AND IMPLEMENTING LEVEL 2 RESTRICTIONS FOR WATER USE REDUCTION TO OUTDOOR URBAN WATER USE

WHEREAS, at the June 15, 2009 City Council meeting, the City Council adopted Ordinance No. 4122 a "Water Conservation and Water Supply Shortage Program" ("Water Conservation Program") that became effective immediately upon adoption pursuant to Water Code Section 376;

WHEREAS, the Water Conservation Program allows the City Council to declare by Resolution a water supply shortage level, and states that the conservation requirements shall take effect on the 10th day after the water shortage level is declared;

WHEREAS, on January 17, 2014, Governor Edmund G. Brown Jr. issued a Drought Emergency Proclamation (January 2014 Proclamation) due to the dire drought conditions and the need to conserve more;

WHEREAS, on February 24, 2014, the City Council adopted a Resolution to request a voluntary water use reduction by all City water customers in response to Governor Brown's Drought Declaration and Metropolitan Water District's (MWD) Statement regarding California's Water Supply Shortage;

WHEREAS, Water Code Section 1058.5 grants the State Water Resources Control Board (SWRCB) the authority to adopt emergency regulations in certain drought years to: "Prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter's priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports".

WHEREAS, On July 15, 2014, SWRCB adopted an emergency regulation to support water conservation (Resolution No. 2014-0038) and that regulation became effective July 28, 2014 after approval by the Office of Administrative Law (OAL).

WHEREAS, On March 17, 2015, the SWRCB adopted a Resolution to implement an Expanded Emergency Water Conservation requirement due to the continuing emergency drought conditions (Executive Order B-29-15) to safeguard the State's remaining water supply.

WHEREAS, on May 5, 2015, the SWRCB has adopted a Regulatory Framework to outline the Governor's Executive Order and mandatory actions that need to be taken by water suppliers.

WHEREAS, the City of Pomona is an urban water supplier as defined by Water Code Section 10617;

WHEREAS, as an urban water supplier, the City of Pomona shall comply with California Code of Regulations, Title 23, Sections 863, 864, and 865, under the State Emergency Drought Water Conservation measures, and which requires that the City implement the stage of its water shortage contingency plan that imposes mandatory restrictions on outdoor irrigation;

WHEREAS, the City of Pomona shall comply with California Code of Regulations, Title 23, Sections 351 and 352, by publishing on May 11, 2015, a notice of public hearing in newspaper to allow consumers an opportunity to be heard to protest against the declaration.

WHEREAS, to ensure the City meets the Emergency Water Conservation requirements set forth by the SWRCB in the Regulatory Framework, the City shall reduce their potable water production by 20 percent per the conservation standard based on relative per capita water usage. The conservation standards require the City of Pomona to reduce potable water use of 20 percent.

WHEREAS, a Level 2 Water Supply Shortage, which imposes mandatory restrictions on outdoor irrigation and limits number of days per week that customers can irrigate outdoors, be declared and implemented by the City Council.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. In addition to the Water Conservation Program's permanent water conservation requirements established by Ordinance No. 4122, the City Council hereby declares a Level 2 Water Supply Shortage throughout the City and directs the City Manager to implement the following Level 2 water conservation requirements:

(1) *Limits on Watering Days.* Watering or irrigating of lawn, landscape or other vegetated area with potable water during the months of April through October is limited to two (2) days per week on the following schedule:

- Odd addresses on Monday and Thursday
- Even addresses on Tuesday and Friday

During the months of November through March, watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to no more than one (1) day per week on the following schedule:

- Odd addresses on Thursday
- Even addresses on Tuesday

This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when an emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 48 hours of notification by the City unless other arrangements are made with the City.

(3) *Limits on Filling Lakes or Ponds*: Filing or refilling ornamental lakes or ponds are prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this division.

(4) *Limits on Washing Vehicles*: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat, motor home or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a recirculating water system to capture or reuse water.

(5) Limits on Filling Residential Swimming Pools and Spas. For existing pools and outdoor spas, re-filling with potable water is limited to no more than one (1) foot per week. Initial filling of residential swimming pools or outdoor spas with potable water is prohibited, except upon written authorization from the City Manager or designee.

(6) *Other Prohibited Uses.* The City may implement other prohibitions on water uses as determined by the City, upon reasonable notice to customers.

SECTION 2. The City of Pomona shall comply with the Governor's Executive Order B-29-15 signed on April 1, 2015, and implement the State Water Resources Control Board Resolution adopted on May 5, 2015 to reduce potable water usage by 20 percent by February 2016.

SECTION 3. In accordance with "Division 4 – Water Conservation and Water Supply Shortage Plan" of the Pomona City Code, the City Council hereby directs the City Clerk to publish this Resolution in a local newspaper within seven (7) days of adoption of this Resolution.

SECTION 4. That the City Clerk shall attest and certify to the passage and adoption of this Resolution and it shall become effective immediately upon its approval.

APPROVED AND ADOPTED THIS 18TH DAY OF MAY 2015.

ATTEST:

Eva M. Buice, MMC, City Clerk

CITY OF POMONA:

Elliott Rothman, Mayor

APPROVED AS TO FORM:

Arnold Alvarez-Glasman, City Attorney

STATE OF CALIFORNIA
COUNTY OF LOS ANGELES
CITY OF POMONA

I, EVA M. BUICE, MMC, CITY CLERK of the City of Pomona do hereby certify that the foregoing Resolution was adopted at a Regular Meeting of the City Council of the City of Pomona held on the 18th day of May 2015, by the following vote:

AYES: Nolte, Robledo, Carrizosa, Lantz, Escobar, Mayor Rothman
NOES: None
ABSENT: Martin
ABSTAIN: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City of Pomona, California, this 19th day of May 2015.

Eva M. Buice, MMC, City Clerk

RESOLUTION NO. 2016-106

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA, CALIFORNIA, DECLARING A LEVEL 1 WATER SUPPLY SHORTAGE AND IMPLEMENTING LEVEL 1 RESTRICTIONS FOR WATER USE REDUCTION FOR OUTDOOR URBAN WATER USE AND MAKING CONSERVATION A WAY OF LIFE FOR POMONA WATER CUSTOMERS

WHEREAS, at the June 15, 2009 City Council meeting, the City Council adopted Ordinance No. 4122 a "Water Conservation and Water Supply Shortage Program" ("Water Conservation Program") that became effective immediately upon adoption pursuant to Water Code Section 376;

WHEREAS, the Water Conservation and Water Supply Shortage Program allows the City Council to declare by Resolution a water supply shortage level, and states that the conservation requirements shall take effect on the 10th day after the water shortage level is declared;

WHEREAS, on January 17, 2014, Governor Brown issued a Drought Emergency Proclamation (January 2014 Proclamation) due to the dire drought conditions and the need to conserve more;

WHEREAS, on February 24, 2014, the City Council adopted a Resolution to request a voluntary water use reduction by all City water customers in response to Governor Brown's Drought Declaration and Metropolitan Water District's (MWD) statement regarding California's Water Supply Shortage;

WHEREAS, On April 25, 2014, the Governor signed a secondary Executive Order to continue the State of Emergency due to the ongoing drought;

WHEREAS, On July 15, 2014, State Water Resource Control Board (SWRCB) adopted an emergency regulation to support water conservation (Resolution No. 2014-0038) and that regulation became effective July 28, 2014 after approval by the Office of Administrative Law (OAL).

WHEREAS, On March 17, 2015, the SWRCB adopted a Resolution to implement an Expanded Emergency Water Conservation requirement due to the continuing emergency drought conditions (Executive Order B-29-15) to safeguard the State's remaining water supply;

WHEREAS, On April 1, 2015, the Governor signed a subsequent Executive Order to mandate a Statewide reduction in water use of 25% from 2013 levels, elimination of irrigation of turf in medians with potable water, and issuance of fines for water violations;

WHEREAS, on May 5, 2015, the SWRCB adopted a Regulatory Framework to outline the Governor's Executive Order and mandatory actions that need to be taken by water suppliers;

WHEREAS, on May 18, 2015, the City Council adopted a Resolution to request Level 2 Water Supply Shortage and Use reductions by all City water customers in response to Governor Brown's Emergency Drought Declaration implementing limits of outdoor watering days to two-days per week from April through October, and one day per week November through March;

WHEREAS, on March 1, 2016, new urban water supplier conservation standards were set by the SWRCB, and required the City of Pomona to reduce by 20%, but was modified on March 15, 2016 to 18%;

WHEREAS, on May 9, 2016, the Governor issued an Executive Order that directs the SWRCB to adjust and extend the emergency water conservation regulations through the end of January 2017 in recognition of the differing water supply conditions for many communities;

WHEREAS, on May 18, 2016, the SWRCB adopted an emergency water conservation regulation that replaces the February 2, 2016 emergency regulation. The May 2016 regulation will be in effect from June 2016 through January 2017, and requires locally developed conservation standards based on each agency's circumstances. It replaces the prior percentage reduction-based water conservation standard with a localized "stress test" approach;

WHEREAS, the City of Pomona submitted the Water Supply Reliability Self-Certification form to the SWRCB by the June 22, 2016 deadline, and the data submitted demonstrated the City has adequate water supplies and facilities (with upgrades by 2017) to deliver the necessary water needs to the community for the next three-years, assuming three more dry years like the ones the State experienced from 2012 to 2015;

WHEREAS, due to the change in current water supply conditions, it is recommended that the City Council adopt a Resolution rescinding the Level 2 Water Supply Shortage and Use Restrictions (remove the two-days a week outdoor watering restrictions) which were originally adopted by Resolution No. 2015-41;

WHEREAS, although the water supply picture has improved, the City shall demonstrate good water conservation practices by continuing to conserve its water supply and make water conservation a "Way of Life" and preserve this precious natural resource; and

WHEREAS, a Level 1 Water Supply Shortage, which imposes mandatory restrictions on outdoor irrigation and limits the number of days per week that customers can irrigate outdoors, be declared and implemented by the City.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. In addition to the Water Conservation Program's permanent water conservation requirements established by Ordinance No. 4122, the City Council hereby declares a Level 1 Water Supply Shortage throughout the City and directs the City Manager to implement the following Level 1 water conservation requirements:

(1) *Limits on Watering Days:*
Watering or irrigating of lawn, landscape or other vegetated areas with potable water during the months of April through October is limited to no more than three (3) days per week on the following schedule:

- Odd addresses on Tuesday, Thursday and Saturday (addresses ending with 1, 3, 5, 7, 9)
- Even addresses on Monday, Wednesday and Friday (addresses ending with 0, 2, 4, 6, 8)

Watering or irrigation of lawn, landscape or other vegetated areas with potable water during the months of November through March is limited to no more than one (1) day per week on the following schedule:

- Odd addresses on Thursday (addresses ending with 1, 3, 5, 7, 9)
- Even addresses on Monday (addresses ending with 0, 2, 4, 6, 8)

This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when an emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by the use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

(2) *Obligation to Fix Leaks, Breaks or Malfunctions.* All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 72 hours of notification by the City unless other arrangements are made with the City.

(3) *Other Prohibited Uses.* The City may implement other prohibitions on water uses as determined by the City, upon reasonable notice to customers.

SECTION 2. The City of Pomona shall comply with Governor Brown's Executive Order No. B-37-16 issued May 9, 2016, and the SWRCB emergency action to adopt section 864.5 and to readopt and further amend sections 863, 864, 865, and 866 in Title 23 of the California Code of Regulations, which pertain to drought emergency water conservation. The emergency regulatory action is effective on May 31, 2016, and will expire on February 28, 2017.

SECTION 3. In accordance with "Division 4 – Water Conservation and Water Supply Shortage Plan" of the Pomona City Code, the City Council hereby directs the City Clerk to publish this Resolution in a local newspaper within seven (7) days of adoption of this Resolution.

SECTION 4. That the City Clerk shall attest and certify to the passage and adoption of this Resolution and it shall become effective immediately upon its approval.

APPROVED AND ADOPTED THIS 18TH DAY OF JULY 2016.

ATTEST:

Eva M. Buice, MMC, City Clerk

CITY OF POMONA:

Elliott Rothman, Mayor

APPROVED AS TO FORM:

Arnold Alvarez-Glasman, City Attorney

STATE OF CALIFORNIA
COUNTY OF LOS ANGELES
CITY OF POMONA

I, EVA M. BUICE, MMC, CITY CLERK of the City of Pomona do hereby certify that the foregoing Resolution was adopted at a Regular Meeting of the City Council of the City of Pomona held on the 18th day of July 2016, by the following vote:

AYES: Nolte, Robledo, Lantz, Escobar, Martin, Mayor Rothman
NOES: None
ABSENT: Carrizosa
ABSTAIN: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City of Pomona, California, this 19th day of July 2016.

Eva M. Buice, MMC, City Clerk

APPENDIX B

CITY OF POMONA NATURAL HAZARD MITIGATION PLAN

City of Pomona
Local
Hazard Mitigation
Plan Update
(2022-2027)

505 South Garey Avenue

Pomona, CA 9176

March 30, 2022

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LHMP Update Document Organization

CITY OF POMONA LOCAL HAZARD MITIGATION PLAN UPDATE (2022-2027)

The City of Pomona is seeking FEMA approval for this Local Hazard Mitigation Plan Update. The City of Pomona *Local Hazard Mitigation Plan Update (2022-2027)* establishes the City's strategy to implement improvements and programs to reduce community impacts in the event of local hazards. Prepared pursuant to the federal Disaster Mitigation Act of 2000, the LHMP comprehensively identifies potential local hazards, the extent of the risks posed by the hazards, the vulnerabilities of the City to these hazards, and actions the City will take to mitigate or reduce the potential impact of the hazards. Pomona initially adopted a Natural Hazards Mitigation Plan in 2015. This 2022 – 2027 Local Hazard Mitigation Plan (LHMP) is an update of the Natural Hazards Mitigation Plan approved by FEMA in 2015.

While the frequency of disaster occurrence is low, Pomona is susceptible to major local hazards with potential for catastrophic consequences. The ensuing devastation could tremendously disrupt daily activities, commerce, and economic development as well as the functions of the City and other public agencies, in addition to causing untold tragedy in life loss and widespread injuries. Earthquakes top the list of local hazards with potential widespread impacts in Pomona, as well as wildfire, landslides, flooding, windstorm, and pandemic/infectious disease.

The LHMP builds upon preparedness and hazard reduction programs currently employed by the City. There are, however, a variety of risks with potential for considerable community impacts that require commitment of additional City resources and staff. By partnering with emergency response providers and community members in the implementation of the actions outlined in this document, the City can achieve a greater level of resiliency and will avoid major disruptions and upheaval associated with a natural disaster.

ORGANIZATION

The LHMP is organized into eleven Chapters, beginning with an introduction to the plan which examines the purpose, process, and implementation and maintenance, as well as public participation, and related planning efforts. Chapter 2 outlines the community profile including the demographics, geography, existing land use and development patterns that are critical to understanding how to mitigate local hazards. Chapter 3 assessing the vulnerabilities particular to Pomona, while Chapters 4 through 9 assess individual hazards. Chapter 10 outlines the City's goals and objectives for this LHMP, and Chapter 11 outlines existing and proposed mitigation efforts. The appendices provide supplementary information and resources.

The structure of the LHMP document is outlined below.

1. Introduction
2. Community Profile
3. Risk Assessment
4. Earthquake
5. Landslide
6. Wildfire
7. Flooding
8. Windstorm
9. Infectious Disease
10. Goals and Objectives
11. Mitigation Action Plan

Appendices

A. Public Participation Survey Materials & TAC Meeting Agendas
B. HAZUS Report
C. Resource Directory and Pomona Organizational Charts
D. Economic Analysis Guidelines for Local Hazard Mitigation Projects
E. List of Acronyms
F. Glossary

1 Introduction

1.1 Background

The City of Pomona is a desirable place to live with many attractive features: a favorable climate, diverse employment opportunities, historic downtown and neighborhoods, and more affordable housing than many of its neighboring communities. This quality of life attracts many new residents each year, resulting in a relatively steady growth rate over the last few decades. The population of Pomona grew from 149,058 in 2010 to 151,713 in 2019, a grow rate of approximately 1.8%[1]. Along with this growth, however, comes numerous challenges, one of which is how to effectively manage threats to the city resulting from a local hazard event. Southern California is home to a host of potential local hazards that could cause significant injury, loss of life, and property damage.

LOCAL HAZARDS

In Pomona, the greatest hazard threats are ground shaking and liquefaction from a major earthquake, although landslide, wildfire, flooding, windstorm events, and infectious disease also have potential to endanger people and/or property. As the City continues to grow, the exposure to these hazards increases, and the accompanying potential for negative impacts becomes even greater. Pomona's status as a nearly built-out city with limited natural open spaces, surrounded by substantially urban uses, affects the types of hazards and potential consequences of concern.

Pomona has been impacted by local hazards - namely earthquake and flooding in prior years. One of the most memorable disasters was a train wreck known to have occurred about 1900. The possible cause was a major earthquake registering approximately 6.5 on the Richter scale along the San Jacinto Fault on December 25, 1899. Over one hundred passengers were seriously injured. Because Pomona had no medical facility, injured passengers were taken into private homes and cared for by Pomona residents. This incident was the catalyst for Pomona to build a hospital, which today is Pomona Valley Hospital Medical Center. The Whittier-Narrows Earthquake of 1987 resulted in damage to many valued historic buildings, and several damaged unreinforced masonry buildings in the downtown area required demolition. Pomona has also had a long history of significant flooding in the eastern portions. Drainage improvements in the 1950s and 1960s and the construction of the San Antonio Dam have alleviated this hazard, although some localized flooding still occasionally occurs during heavy rainstorms (Reference 2).

To date, Pomona has not experienced disasters requiring a request for a Presidential Disaster Declaration and associated emergency assistance funds, with the exception of COVID-19 disaster

[1] *U.S . Census Bureau: United States Population and Housing Counts, 2010 and 2019.*
[2] *Gallivan, Mickey. President. Pomona Historical Society. Written Communication. June 22. 2004.*

declared on March 13, 2020, for the entire United States. The fact that a catastrophic situation requiring this request has rarely occurred should not in any way be interpreted as prediction of low hazard risk for the future. An event like the 1994 Northridge Earthquake, with damage totaling nearly 50 billion dollars, could realistically occur in Pomona.





Above. The derailment of a train in 1899 in Central Pomona prompted the construction of the City's hospital – Pomona Valley Hospital Medical Center. Traveling at high speeds, the train jumped track, potentially due to track damage caused by a large earthquake that occurred in the region on the same *day.*

HAZARD MITIGATION PLANNING

Exact prediction of disasters and the extent of impact on the city is impossible. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from local hazard events. Mitigation planning is an effective method of reducing risk from such local hazards. It is defined as "sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects[3]." This *Local Hazard Mitigation Plan* is the culmination of extensive research, analysis, and community outreach undertaken by the City of Pomona to identify potential local hazard risks and establish appropriate and effective mitigation to reduce the risks.

1.2 PURPOSE OF THE LHMP

In response to a series of costly and damaging disasters, Congress passed the Disaster Mitigation Act of 2000 (DMA 2000), which establishes a frame-work for proactive local planning for local hazard mitigation. This law requires that every local, county, and state government:

- Conduct an assessment of the local hazards that pose a threat to the jurisdiction;
- Determine the potential financial impact of these hazards;

[3] *Federal Emergency Management Agency, website:www.fema.gov, accessed September 14, 2021*

- Create a plan to mitigate these hazards; and
- Implement the plan to reduce the impacts of local hazards.

The preparation and adoption of such a plan is required in order to be eligible for funding from the Federal Emergency Management Agency (FEMA). This *Local Hazard Mitigation Plan* update for Pomona will ensure that the City is in compliance with this law and will be able to receive funding for mitigation projects and other assistance under DMA 2000.

As the costs of damage from local hazards continue to increase, the community realizes the importance of identifying effective ways to reduce vulnerability to disasters. Local Hazard Mitigation Plans assist communities in reducing risk from local hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City. This LHMP update establishes a set of action items to reduce risk from local hazards through education and outreach programs and to foster the development of partnerships, improvements to maximize emergency service response capabilities, and implementation of preventative activities such as land use programs that restrict and control development in areas subject to damage from local hazards.

1.3 RELATED MITIGATION PLANNING EFFORTS

The Pomona LHMP addresses local hazards, risks, and mitigation actions for the entire city. However, a variety of agencies and organizations have facilities in the city and take the lead on mitigation planning efforts for their facilities. LHMPs are under preparation or have been completed by the following for facilities located within Pomona:

- State of California Hazard Mitigation Plan, for State-owned facilities such as freeways, Cal Poly Pomona; and school district facilities, completed in 2013 and updated in 2018
- County of Los Angeles All Hazards Mitigation Plan, for County-owned facilities such as the courts; completed in 2014 and updated in 2019
- Pomona Valley Hospital Medical Center Emergency Operations Plan, completed in 1994 and most recently updated in December 2020.

Major utility infrastructure in Pomona is owned, operated, and managed by entities other than the City, such as Southern California Edison, Union Pacific Railroad, Southern California Gas Company, and the Los Angeles County Metropolitan Transportation Authority (MTA). Maintenance and emergency preparedness of these types of facilities are not under the City' s jurisdiction, although the City has a responsibility to coordinate with these infrastructure providers on emergency preparedness and risk reduction strategies, and advocate safety for Pomona residents, business, and property.

Partners and resources exist at the regional, State, and federal levels. Numerous State agencies have a role in local hazards and local hazard mitigation. Some of the key agencies include:

- The Governor's Office of Emergency Services (OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- The Southern California Earthquake Center (SCEC), gathers information about earthquakes, integrates this information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives;
- The California Division of Forestry (CDF) is responsible for all aspects of wildland fire protection on private, and state lands, and administers forest practices regulations, including landslide mitigation, on non-federal lands;
- The California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, the development of partnerships aimed at reducing risk of geologic and seismic hazards, including landslides and tsunamis; and
- The California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public and serves local water needs by providing technical assistance.

1.4 RELATED CITY PLANS AND DOCUMENTS

This LHMP update works in conjunction with other City plans and documents, specifically the General Plan, Zoning Code, the Emergency Operations Plan (EOP), and the Standard Emergency Management System (SEMS). The status of these documents is described below. The planning mechanisms in these documents will be amended to incorporate the LHMP mitigation actions.

POMONA GENERAL PLAN

The *Pomona General Plan* establishes a city-wide development plan and policies to help achieve the community's vision and goals for the City. Topics addressed in the *General Plan* include land use, circulation, economic development, urban design, historic and natural resources, open spaces, noise, as well as public safety. A comprehensive update of the *Pomona General Plan* was adopted in 2014. The Safety Element of the General Plan will be updated to address evacuation routes following the adoption of this LHMP update, and a comprehensive update to the General Plan will commence in the next 4-5 years. Through these updates, the City will seek to expand and improve on policies to reduce the risk of local hazards and will incorporate relevant information from this LHMP update.

ZONING CODE

The *Pomona Zoning Ordinance* establishes regulations for development in the City, implementing the General Plan policy framework. The Zoning Ordinance is currently being updated and will be revised to reflect the directives in the General Plan. The City will incorporate relevant information

from this LHMP update to reduce the risks of local hazards, through the incorporation of improved development standards and consideration of restricting growth in areas of the City subject to severe hazards.

EMERGENCY OPERATIONS PLAN (EOP) AND STANDARDIZED EMERGENCY MANAGEMENT SYSTEM (SEMS)

The Emergency Operation Plan (EOP) last updated in 2011 establishes the emergency organization, task assignments, policies and general procedures, and coordination of the various emergency staff and service elements utilizing the Standardized Emergency Management Systems (SEMS). The objective is to incorporate and coordinate all the facilities and personnel of the City into an efficient organization capable of responding to any emergency, as an extension of the California Emergency Plan. In the event of a large-scale local hazard, technological incident or national security emergency, the City would employ the communication protocols and systems for emergency response established in the *Standardized Emergency Management System Plan.* Mitigation actions have been included in this LHMP update that incorporate policies and procedures from the EOP and SEMS, and conversely, when the EOP is next updated, relevant mitigation efforts from this LHMP update will be incorporated.

1.5 PLANNING PROCESS

In preparing the LHMP, the City utilized a step-by-step planning process incorporating thorough research, analysis, and participation by stakeholders and community members. This planning process consisted of six major steps:

- Identification of issues pertaining to local hazards, community risks and vulnerabilities, preparedness, and awareness;
- Intensive research and mapping of hazards, critical facilities, and vulnerabilities to identify potential risks in Pomona;
- Rating of risks according to potential extent of damage, injury and life loss, and severity of service disruptions impairing community functioning;
- Formulation of mission, goals, and objectives;
- Evaluation of mitigation actions to reduce risks and improve preparedness; and
- Plan preparation.

Community members, stakeholders, and partners in emergency preparedness were involved in each step providing input and assistance as described below.

1.6 STAKEHOLDER PARTICIPATION

Emergency preparedness and response in a city like Pomona depends on the coordinated efforts of emergency service providers, infrastructure partners, community leaders, and residents themselves. To be comprehensive, feasible, and effective, mitigation planning for local hazards must proceed in coordination with these entities. For these reasons, a multi-component public participation program was integrated with the planning process for the LHMP. The public participation program included:

- Technical Advisory Committee (TAC) comprised of members representing City departments, school district, medical facilities, airport and transit facilities, and utility and emergency service providers who provided input;
- Public survey;
- City Council presentation;
- Communications with stakeholders and partners to acquire data and planning information.

Table 1-1: Technical Advisory Committee

NAME	TITLE	AGENCY/DEPT.	EMAIL
CITY			
Naela Cansino, ARM	Safety & Emergency Mgmt. Officer	Risk Management	naela.cansino@pomonaca.gov
Chris Millard	Risk Manager	Risk Management	chris.millard@pomonaca.gov
Linda Matthews	Human Resources/Risk Management Director	Human Resources	linda.matthews@pomonaca.gov
Rene Guerrero	Public Works Director	Public Works	rene.guerrero@pomonaca.gov
Benita DeFrank	Neighborhood Services Director	Neighborhood Services	Benita.defrank@pomonaca.gov
Anita Gutierrez	Development Services Director	Development Services	anita.gutierrez@pomonaca.gov
Chris Diggs	Water Resources Director	Water Resources	chris.diggs@pomonaca.gov
Lt. Steve Congalton	Watch Commanders Office	Police	steve.congalton@pomonaca.gov
HEALTH CARE/MEDICAL SERVICE PROVIDERS			
Steven Storbakken	Director of Emergency	Pomona Valley Medical Center	steven.storbakken@pvhmc.org

	Preparedness		
Rimmi Hundal	Director	Tri-City Mental Health	rhundal@tricitymhs.org
Lisa Naranjo	Program Supervisor	Tri-City Mental Health	lnaranjo@tricitymhs.org
Erica Frausto Aguado	Executive Director for Greater San Gabriel and Pomona	American Red Cross	erica.fraustoaguado@redcross.org
Jose De Leon	Facilities Manager	San Gabriel Regional Center	jdeleon@sgprc.org
UTILITIES			
Bob Cruz	Regional Public Affairs Manager	Sempra/SoCal Gas	rcruz1@semprautilities.com
Marissa Castro-Salvati	Local Public Affairs Regional Manager	Southern California Edison	marissa.castro@sce.com
AIRPORT & TRANSIT			
Sam Carter	Airport Manager	Brackett Airport	scarter@americanairports.net
Dave Price	Assistant Airport Manager	Brackett Airport	pocasstmgr@americanairports.com
Tanya Pina	Emergency Contact	Foothill Transit	tpina@foothilltransit.org
LaShawn Gillespie	Emergency Contact	Foothill Transit	lgillespie@foothilltransit.org
COUNTY EMERGENCY SERVICES			
Jim Robinson	Assistant Fire Chief	LA County Fire	jim.robinson@fire.lacounty.gov
Diana Manzano-Garcia	Disaster Area Management Coordinator	Area D Community Emergency Response Team (CERT)	dmanzano@areadonline.com
BUSINESS & COMMUNITY INTERESTS			
Lorena Parker	Executive Director	Downtown Pomona Owner's Association	lorena@downtownpomona.org
Rene Martin	Chairman	Ecumenical and Interfaith Relations Committee	rene.joseph.martin@gmail.com
Monique	President & CEO	Chamber of	mmanzanares@pomonachamber.org

Manzanares		Commerce	
Minerva Hernandez	President	Hispanic Chamber of Commerce	cdhpomona@gmail.com
Barry Gillies	Director of Property Operations	Pomona Fairplex	gillies@fairplex.com
Doreen Weatherly	Safety Services Manager	Pomona Fairplex	weatherly@fairplex.com
SCHOOL DISTRICT			
Richard Martinez	Superintendent of Schools	Pomona Unified School District	Richard.martinez@pomona.k12.ca.us

LHMP UPDATE SCHEDULE

- The City released a Request For Proposals from qualified firms to update the LHMP on August 3, 2020.
- LHMP update kickoff meeting occurred on March 25, 2021. The attendees were able to review the departments that were involved in the original preparation and identified representatives from outsides agencies that could be invited to be members. The LHMP City project manager provided a list of agencies and organizations that participated in the 2012 NHMP adopted in 2015, and Interwest staff contacted each organization to update contacts and initiate the outreach process via email and phone correspondence.
- The TAC agreed upon a planning process/public outreach method. A public outreach online survey would be used for the 2022 update due to the ongoing COVID 19 pandemic. A review process of this survey was undertaken and comments and/or changes were subsequently made.
- The TAC also reviewed the hazards listed in the 2015 document and added pandemic to the list of hazards. Weekly Update Committee meetings were held for the first several weeks of this LHMP update, then shifted to bi-weekly meetings in late May 2021.
- A link and QR Code for the public survey were posted to the City's LHMP Update webpage on June 28, 2021 and provided in English and Spanish. Advertisements for the survey were posted to Instagram, Facebook, the City's website and TV station, the electronic message board outside of City Hall, and in the Pomona weekly report through the months of July and August. Survey flyers were also handed out to the public at the Public Resource Fair on November 6, 2021.
- A public meeting to introduce the LHMP to the City Council was held on May 17, 2021. No members of the public attended the meeting. The presentation was given by City staff and Interwest Consulting Group staff, which resulted in a discussion about Pomona's proximity to several earthquake faults, drought, fires, and pandemic.
- Email correspondence with Technical Advisory Committee agency members began in the last week of May with correspondence continuing through November of 2021.
- Meetings with City Departments occurred from January through March to update Mitigation Action Items and other background information (Appendix A).

TECHNICAL ADVISORY COMMITTEE MEETINGS

- **March 25, 2021** – Kick-off meeting to introduce Technical Advisory Committee and project schedule.
- **April 12, 2021** – Meeting to determine public outreach strategy and COVID 19 limitations, addition of pandemic/infectious disease as a new hazard, and requirement to address impacts of climate change on local hazards.
- **April 19, 2021** – Review of public survey and determination of when and how to release to public. Discussed presenting the LHMP update to City Council.
- **May 3, 2021** – Discussed annexations and major construction projects since 2012. May 17, 2021, chosen as City Council presentation date.
- **May 17, 2021** – Reviewed Power Point presentation for City Council and launch of public survey after the City Council presentation.
- **June 1, 2021** – Discussed update to hazard maps and other maps relevant to the LHMP update.
- **June 14, 2021** – New Emergency Services Manager introduced to TAC team and to take over management of LHMP update.
- **June 28, 2021** – Update to project timeline and discussion strategy to increase participation of public survey.
- **July 12, 2021** – Updates provided relating to City demographics.
- **July 26, 2021** - Check -in on survey participation and request for related City documents.
- **August 9, 2021** – Discussion regarding area schools and hospitals.
- **August 23, 2021** – Request for information regarding City facilities including water facilities such as reservoirs.
- **September 6, 2021 –** Discussed changing document name from Natural Hazard Mitigation Plan to Local Hazard Mitigation Plan. Also, updated City staff on HAZUS Report.
- **September 20, 2021** – Confirmation of critical facilities (Police and Fire Stations) number and status.
- **October 4, 2021** – Discussed lack of participation in public survey and City events to present informational flyers with QR Code to public survey. Decided on November 6, 2021, Resource Fair.
- **October 18, 2021** - Discussed additional information from the Housing Element Update to include in the LHMP Update. Coordinated with Emergency Services Manager to begin outreach with City Departments to update Mitigation Action Plan.
- **November 1, 2021** – Discussed who would be present for the November 6 Resource Fair to hand out informational flyers and answer questions as Interwest staff members not available to attend.
- **December 13, 2021** – Reviewed initial responses to Mitigation Action Plan update.
- **January 10,2021** – Discussed need for more in-depth department interviews to address updates to Mitigation Action Plan.
- **January 27, 2021** – Interview with Director of Neighborhood Services to discuss outstanding items, and Mitigation Actions under Neighborhood Services responsibility.

- **February 3, 2021** – Interview with Directors of Public Works and Water Resources Department to discuss outstanding items, and Mitigation Action items under department responsibility.
- **February 7, 2021** – Interview with Emergency Services Manager to discuss outstanding items, and Mitigation Action Items under Risk Management Division responsibility.
- **February 14, 2021** – Interview with Director of Development Services to discuss outstanding items, and Mitigation Action Items under department responsibility.
- **March 7, 2021** – Interview with Police Department to discuss Mitigation Action Items under department responsibility.

ONLINE PUBLIC SURVEY

To better understand the community's understanding and concerns regarding natural hazards and local response, the City solicited input from the community in the form of an online survey to determine:

- How the community prioritizes hazards facing the City.
- Actions the City and community can take to reduce future damage from natural hazards.
- How local government officials can better communicate natural hazard risks to the public.

The survey included 12 questions and a comment section created to identify the respondent's connection with City of Pomona, experience with previous natural hazard events, preparedness for future hazards, and opportunities to create a community more resilient to local hazards.

To ensure the community had ample opportunities to provide input, the City promoted the survey using the following methods:

- City website – The City placed a link to the survey in a prominent location on the City's website homepage, ensuring all website visitors were aware of the opportunity.
- A City Council presentation introducing the Local Hazard Mitigation Plan and the importance of maintaining an up-to-date version of this LHMP. The presentation included information about the survey.
- Hard Copy surveys – The City provided paper (hard) copies of the survey at counters of City department offices including City Hall and handed out at the Resource Fair on November 6, 2021.

Outreach materials used to promote the public survey can be found in Appendix A.

PUBLIC SURVEY RESULTS

The following summary highlights the key responses and findings of the survey. These survey results help to inform staff of community concerns.

Community Participation

The City received responses to the survey from 62 individuals (62 in English, and 0 in Spanish).

Level of Concern

Respondents were asked to review the city's likely natural hazards and rate their level of concern on a scale from not concerned, not very concerned, neutral, somewhat concerned, to very concerned, for each local hazard. Climate change was identified as the highest level of concern among participants. While climate change is not identified as a specific hazard in this LHMP, it has the potential to impact all of the listed hazards, either directly or indirectly. Of the listed hazards in this LHMP, participants indicated the highest levels of concern for earthquakes, pandemics, and wildfire hazards/brush fire respectively pandemic which may have been temporarily inflated due to the fact that the worldwide COVID-19 pandemic was still ongoing at the time the survey was released. Lowest levels of concern include flood, dam failure and inundation hazards, severe windstorms, and landslides.

Actions to Prepare

The results of the survey indicate that many respondents have taken actions to reduce damage from a local hazard. The majority of respondents had purchased homeowners' insurance (75.81%), talked with family members about what to do in case of a disaster or emergency (54.84%), and prepared a "Disaster Supply Kit" (53.23%).

Local Government Efforts to Reduce Hazards

Respondents were asked to provide input as to the most important things the local government can do to help the community be more prepared for a disaster by ranking them as very important somewhat important, neutral, not very important or not important. Those following measures are ranked based on highest percentage of respondents identifying as very important:

Protecting critical facilities (hospitals, fire stations, etc.):	88.33%
Protecting and reducing damage to utilities:	80.33%
Strengthening emergency services (police, fire, ambulance):	75.41%
Protecting private property:	73.77%
Protecting the natural environment:	65.00%
Protecting K-12 schools:	61.67%
Promoting cooperation among public and private organizations and citizens:	59.02%
Preventing development in hazard areas:	57.38%
Protecting Colleges/Universities:	47.46%
Protecting small businesses:	45.90%
Protecting historical/cultural landmarks, museums, etc.:	37.70%
Protecting major employers:	24.59%

Community Assets

Respondents were asked to determine the importance of protecting the following community

assets for planning for local hazards. Those following community assets are ranked based on highest percentage of respondents identifying as very important:

Human: Loss of life and/or injuries:	90.32%
Governance: Ability to maintain order and/or provide public amenities/services:	77.05%
Infrastructure: Damage or loss of bridges, utilities, schools, etc.:	75.81%
Environmental: Damage or loss of forests, rangeland, waterways, etc.:	59.68%
Economic: Business closures and/or job losses:	56.45%
Cultural Historic: Damage or loss of libraries, museums, fairgrounds, etc.:	41.94%

Incorporation of Public Survey Results

Based on feedback gathered from the public survey, the Mitigation Action Plan focused on mitigations that would address the areas of deepest concern to the community such as protecting human life and property, preserving government facilities and services, improving local utilities and infrastructure, increasing community knowledge through public awareness campaigns.

Public Review Period

The draft 2021 LHMP was released for public review from April 4, 2022 through April 26, 2022. The release of the public draft LHMP was promoted through a variety of means including:

City of Pomona website

City of Pomona social media pages

Inland Valley Daily Bulletin

Hard copy at City Facilities

The public review period of the draft LHMP conclude on April 26, 2022. The public, and City staff provided comments and questions on the draft LHMP. No comments were received from the public, city staff, the TAC, public stakeholders, neighboring communities, or local and regional agencies during the public review period.

1.7 LHMP IMPLEMENTATION AND MAINTENANCE

Implementation of the updated LHMP will involve the coordinated efforts and commitment of City officials, City staff, emergency preparedness partners, and community leaders and residents. The timetable for implementation of the mitigation actions is five years, although a variety of actions will be ongoing once initiated. Other actions may take several years to complete, as detailed in **Chapter 11 Mitigation Action Plan**.

PLAN ADOPTION

The LHMP is intended to be adopted by the City Council, following review and comment by the State Hazard Mitigation Officer in the Governor's Office of Emergency Services, FEMA, and the public. Once adopted, the adoption resolution will be submitted to FEMA for final review and acceptance. Upon acceptance by FEMA, the City will regain eligibility for Hazard Mitigation Grant Program funds.

IMPLEMENTATION STRUCTURE

The Human Resources Department, Risk Management Division will take the lead in supervising implementation, working closely with the LHMP Committee. Each year in an Annual Report, priorities will be established for mitigation implementation, with consideration of cost-effectiveness per FEMA approved techniques. The City will update the LHMP every five years – in coordination with the LHMP Committee and with public input – by evaluating the effectiveness of mitigation implementation, addressing vulnerabilities, incorporating advancements in emergency response and post-disaster services, and updating hazard and risk assessments as new information becomes available. This includes incorporating new data from federal, State, or regional hazard mapping and delineation efforts.

The LHMP implementation structure is established in **Mitigation Action 1.1 in Chapter 11**, which should be referred to for more detail.

MAINTENANCE OF PLAN

The Human Resources Department, Risk Management Division will call an annual meeting that will consist of City departments, the general public and stakeholders to review the Local Hazard Mitigation Plan and take input for any changes or updates that might be needed to the plan. This meeting will take place in November and will be announced through the normal channels the City utilizes for meetings of this type.

2 Community Profile

This Community Profile provides background information on Pomona's geography, environment, population, and economy to better understand local hazards and vulnerabilities of the City. The 2014 *General Plan* is the source for much of the discussion in this chapter and should be referred to for greater detail on conditions, trends, and planning issues.

2.1 INTRODUCTION

Located in the highly urbanized Los Angeles metropolitan area, the City of Pomona shares many attributes with its neighbors. This includes a vulnerability to the volatile natural systems and features that distinguish the area. The semi-arid climate that attracts many people to the region also creates the conditions for fast-spreading wildfires. The infrequent but intense winter rainstorms can create the potential for flooding, should the flood prevention infrastructure ever fail. The hillsides that frame the Pomona Valley and that are home to well-established neighborhoods are also subject to destructive landslide conditions. And perhaps most dramatically, Pomona is located in one of the most earthquake prone urbanized areas in the United States.

Although situated in a high-risk metropolitan region, Pomona has been fortunate to avoid catastrophic local hazard events since its incorporation and development. Southern California earthquakes have impacted Pomona, although major damage has been limited. Fire has also impacted Pomona, although major wildfires such as the kind seen in recent years, have not spread into Pomona. Large scale flooding has not been a threat since the channelization of local creeks, and significant landslides have not caused widespread damage. Nevertheless, the threat of a local hazard event is always present. The potential for property loss and personal injury is particularly profound in Pomona due to its nearly built-out status. As the City continues to intensify with infill development, the risks, as well as the opportunity to build in mitigation, increases.

The inevitability of local hazards, and the growing population and activity within the City, create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future hazard events. Identifying the risks posed by local hazards and developing strategies to reduce the impact of a hazard event, can assist in protecting life and property of citizens and communities. Local residents and businesses have worked together with the City to create this *Local Hazard Mitigation Plan* that addresses the potential impacts of hazard events.

2.2 GEOGRAPHY AND THE ENVIRONMENT

The City of Pomona covers 22.84 square miles, or approximately 14,620 acres in eastern Los Angeles County, approximately 30 miles from downtown Los Angeles. To the west are the cities of the San Gabriel Valley and to the east is the fast-growing San Bernardino-Riverside region, as shown in **Figure 2-1 Regional Location**. The majority of the City is situated on the low-lying floor of the Pomona Valley and is bisected by major transportation corridors - freeways, rail corridors, and arterial roads. The San Jose and Puente Hills provide distinct edges to the northwest and southern boundaries, respectively of Pomona see **Figure 2-2 Topography and City Boundaries**.

Pomona is located on a gently sloping alluvial fan, which originates at the mouth of the San Antonio Canyon and slopes gradually to the south and southwest. Pomona is mostly characterized by flat topography (average slope in the valley floor area is a little under one percent) and there are only minor topographic variations except for the hillside areas to the northwest and south. Elevations in the City range from 1,100 to 1,300 feet in the San Jose and Puente Hills to 800 to 900 feet on the valley floor.
In general, the City is primarily urbanized, with limited open space and parks (221 acres, or 1.5% of total), and vacant areas (597 acres, or 4.1% of total). The City has no major water features, such as rivers or lakes; development patterns were defined in Pomona's early history by the railroad and later by the freeways. Creeks have been channelized and do not create significant physical boundaries.

2.3 HISTORICAL DEVELOPMENT

Pomona is one of the most well-established cities in the San Gabriel Valley. The City was initially plotted out in 1876 as a one square-mile townsite built around the Southern Pacific railroad station and the City itself was later incorporated in 1888, the fifth chartered City in Los Angeles County. Pomona started as a major center for citrus orchards, but also developed a well-defined town area. Residential neighborhoods soon developed, some of which are highly regarded for their exceptional architecture and style. These neighborhoods, along with the unique downtown core, give Pomona a historic character that is a source of community pride and an asset to be protected.

Today, Pomona is the seventh most populous city in Los Angeles County. It is a City with a diverse mix of people, neighborhoods, and business opportunities and has also developed into a very urban place. The City has a well-developed mixed-use downtown that is a center for arts and culture, and the site of substantial redevelopment and infill development.

Figure 2-1: Regional Location



2.4 CLIMATE

One of the Pomona's great assets is its Mediterranean Southern California climate. Average temperatures range from 41 degrees in the winter months to 89 degrees in the summer months. However, the temperatures can vary over a wide range, particularly when the Santa Ana winds blow from October to March, bringing higher temperatures and very low humidity. Temperatures rarely exceed 100 degrees in the summer months (June - September), nor drop below 30 degrees in the winter months (November-March).

Rainfall in the city averages 16.99 inches of rain per year. Over the recorded history of rainfall in Pomona, amounts have ranged from lows of seven inches in some years to 46 inches of rain in very wet years. Furthermore, actual rainfall in Southern California tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. Because the metropolitan basin is largely built out, water originating in higher elevation communities can have a sudden impact on adjoining communities that have a lower elevation such as Pomona.

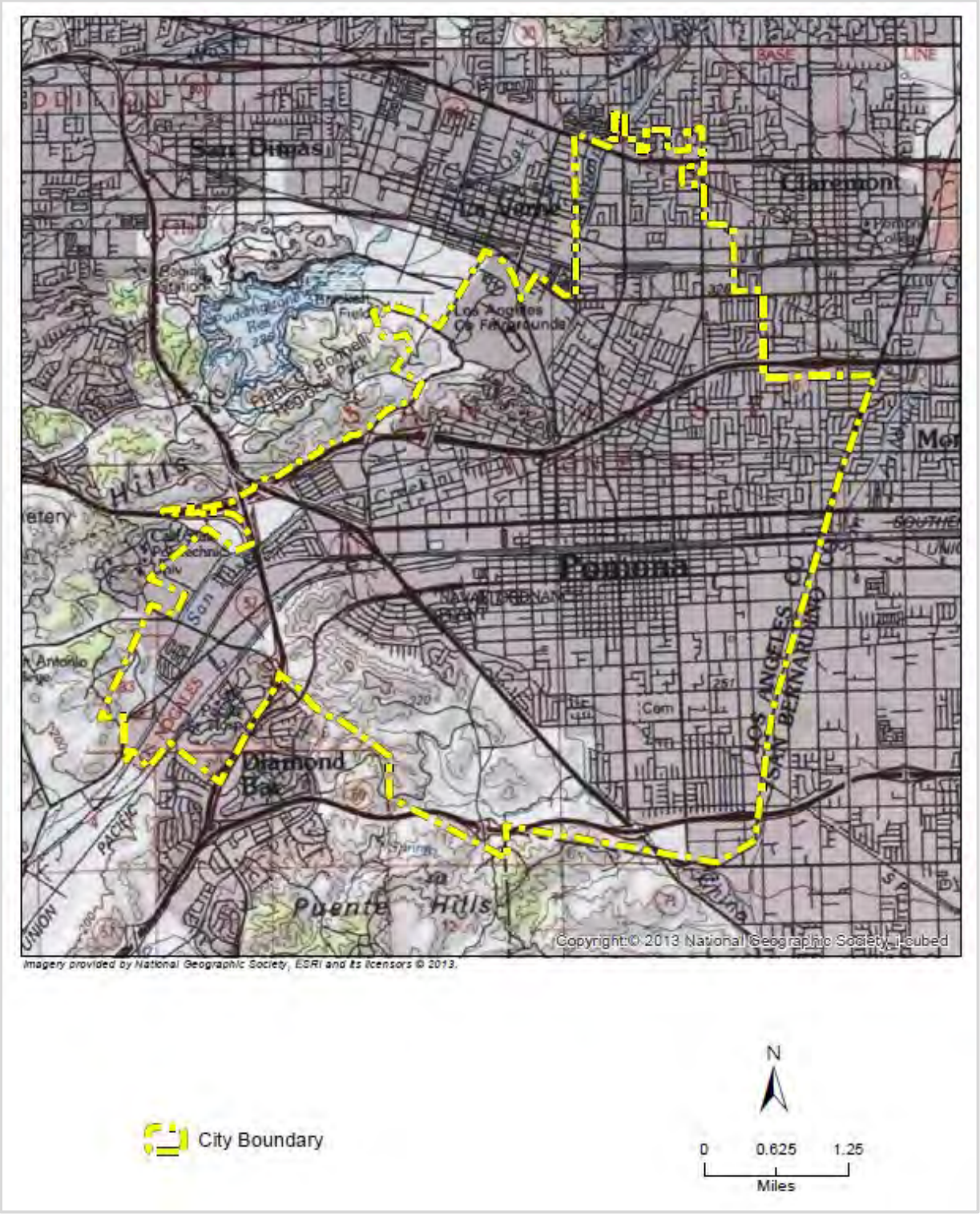
2.5 GEOLOGIC CONDITIONS

REGIONAL GEOLOGIC SETTING

Pomona lies within the western portion of the Transverse Ranges geomorphic province, characterized by numerous earthquake faults. The Transverse Ranges consist of a distinct group of east-west trending ranges and valley that truncate the prevailing north-northwest trend of the southern Coast Ranges and Peninsular Ranges. This region encompasses approximately 325 miles, and extends from Point Aguello, located along the western coast of California, eastward to Joshua Tree National Park, where it merges with the Mojave and Colorado Deserts.

Within the Transverse Ranges there are abundant compressional reverse and thrust normal faults, and curvilinear strike-slip faults that generally trend in an east-west direction. The foremost structural feature that has affected the geologic evolution of the region is the San Andreas fault. This fault has a northwest strike, located both to the north and south of the Transverse Ranges, but changes to a west-northwest strike within the Transverse Ranges, thus forming a bend in the fault. Many of these normal faults break the ground surface south of the San Andreas fault along the southern flank of the San Gabriel and Santa Monica Mountains. The thrust faults that break the surface south of the San Andreas fault dip southward and merge with the broad, buried fold and thrust belts that underlie the Los Angeles basin and the southern margin of the Transverse Ranges.

Figure 2-2: Topography and City Boundaries



REGIONAL FAULTS

The major faults that have the potential to affect the greater Los Angeles Basin, and therefore Pomona, are the San Andreas Fault Zone, Sierra Madre Fault System, Whittier-Elsinore Fault Zone, Verdugo Fault, Norwalk Fault, Santa Monica Fault, San Fernando Fault Zone, and the Newport-Inglewood Fault Zone. These faults are described in greater detail in **Chapter 4 Earthquakes**.

LOCAL FAULTS

In addition to the regional faults, there are several local faults located within the city that are considered potentially active. No recent seismic activity has been recorded along these faults in the last 10,000 years. However, a major earthquake occurring along any of these faults would be capable of generating seismic hazards and strong ground shaking effects within the city. These local faults include the Indian Hill, Chino, Central Avenue, and San Jose Faults. These faults are described in greater detail in **Chapter 4 Earthquakes**.

LOCAL GEOLOGIC SETTING

The City is underlain by alluvium within the valley area and underlain by bedrock on the San Jose Hills on the northwest and the Puente Hills on the southwest. The unconsolidated alluvial soils of the San Gabriel Valley came from the transport of soils from the San Gabriel Mountains to the north, as well as soils that washed out of nearby foothills and the San Antonio canyon area. The alluvial soils are underlain by igneous metamorphic rock, as seen in outcrops in the Puente Hills and San Jose Hills. Soils on the western valley area are made up of unconsolidated coarse sands and gravel near the San Jose Creek, and very fine grain unconsolidated silty sands along the foothills.

The Puente Hills are made up of marine sandstones and siltstones of the Puente formation, with a mixture of volcanic rock and outcrops. The Ganesha Hills are made of igneous metamorphic outcrops, as found on the San Jose Hills. The rocks are as much as 24,000 feet thick and consist of fine to course-grained marine elastic sedimentary rocks of the Cenozoic era (12 million years to 10,000 years ago). These rocks also include volcanic rocks and some non-marine sedimentary rocks.

MINERALS AND SOILS

The characteristics of the minerals and soils present in Pomona indicate the potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquake-induced ground shaking, liquefaction, and landslides.

Within the Pomona area, various soil associations are identified by the Natural Resources Conservation Service (NRCS). These soil associations consist of one or more soil types that have similar characteristics, and each is named for the predominant soil series it contains. Soil series within the City include Tununga-Sobada, Hanford, Cropley, Foster-Grangeville, Chino, Diablo-Altamont, Altamont-Diablo, San

Andreas-San Benito, San Benito-Soper, and Yolo. Generally, soils located in the western valley area comprise unconsolidated coarse sands and gravel, with very fine grain unconsolidated silty sands along the foothills.

Pomona is not located within a Significant Mineral Aggregate Resource Area (SMARA), as designated by the State Department of Conservation, nor is it located in an area with active mineral extraction activities.

2.6 POPULATION AND DEMOGRAPHICS

The City of Pomona has a population of about 151,713 people in an area of 22.84 square miles. The population has steadily increased from the late 1800s through 2020, and increased about 1.75 percent from 2010 to 2020, according to the 2020 Census. This rate of increase is similar the rate of increase for Los Angeles County as a whole over the same time period (1.95 percent).

Considering the historic trends, population growth is expected to continue in Pomona. This increase of people creates more community exposure, and changes how agencies prepare for and respond to natural hazards. For example, more people living in crowded neighborhoods can increase the risks associated with hazard events.

Furthermore, Pomona is experiencing a great deal of in-fill building, which is increasing the population density and creating greater service loads on the built infrastructure, including roads, water supply, sewer services, and storm drains.

According to the census 2019 American Community Survey 1-Year Estimates, the demographic make-up of Pomona is as follows:

Table 2-1: Pomona Demographics

Total Population	151,713
RACE	**% OF POPULATION**
White	21%
Black	5.8%
American Indian/Alaska Native	2.3%
Asian	10.7 %
Native Hawaiian/Pacific Islander	0.2%
Some Other Race	41.3%
Two Races	18.7%
Three Races	0.8%
Four Races	0.09%
AGE	
Median Age	34.3
Under 18 years	25%
Over 18 years	75%
LANGUAGE SPOKEN AT HOME	
English Only	34%
Spanish	56%
Other Indo European	1.1%
Asian and Pacific Islander	8.2%
Other Languages	0.6%
POVERTY BY AGE	
All	13%
Under 18 years	26.1%
Between 18 and 64 years	15.6%
65 years and over	12.9%
EDUCATION ATTAINMENT (POPULATION 25 YEARS AND OVER)	
High School or Equivalent Degree	23.6%
Some College, no Degree	21.1%
Associate's Degree	6.5%
Bachelor Degree	13.3%
Graduate or Professional Degree	4.8%
DISABILITY	
Total	11.8%
Hearing Difficulty	2.6%
Vision Difficulty	2.5%
Cognitive Difficulty	4.6%
Ambulatory Difficulty	6.2%
Self-Care Difficulty	2.6%
Independent Living Difficulty	5.4%
HEALTH COVERAGE	
Population w/out Health Coverage	11.2%

Natural hazards do not discriminate, but the impacts in terms of vulnerability and the ability to recover vary greatly among the population. According to Peggy Stahl of the Federal Emergency Management Agency (FEMA) Preparedness, Training, and Exercise Directorate, 80% of the disaster burden falls on the public, and within that number, a disproportionate burden is placed on special needs groups, women, children, minorities, and the poor. The ethnic and cultural diversity in Pomona suggests a need to address multi-cultural needs and services as described below.

Census data indicates that the number of Pomona residents in poverty decreased from 2010 to 2019. About 13 percent of the population in Pomona was determined to have poverty status in the 2019 estimates, less than the County at 13.4 percent of the population.

Vulnerable populations, including seniors, disabled citizens, women with children, as well as those people living in poverty, may be disproportionately impacted by natural hazards. In Pomona, the percentage of the population over 65 has increased from 7.6 percent in 2010 to approximately 10.6 percent in 2019. However, the percentage of residents under 18 years of age has decreased from 29.6 percent in 2010 to approximately 25 percent in 2019.

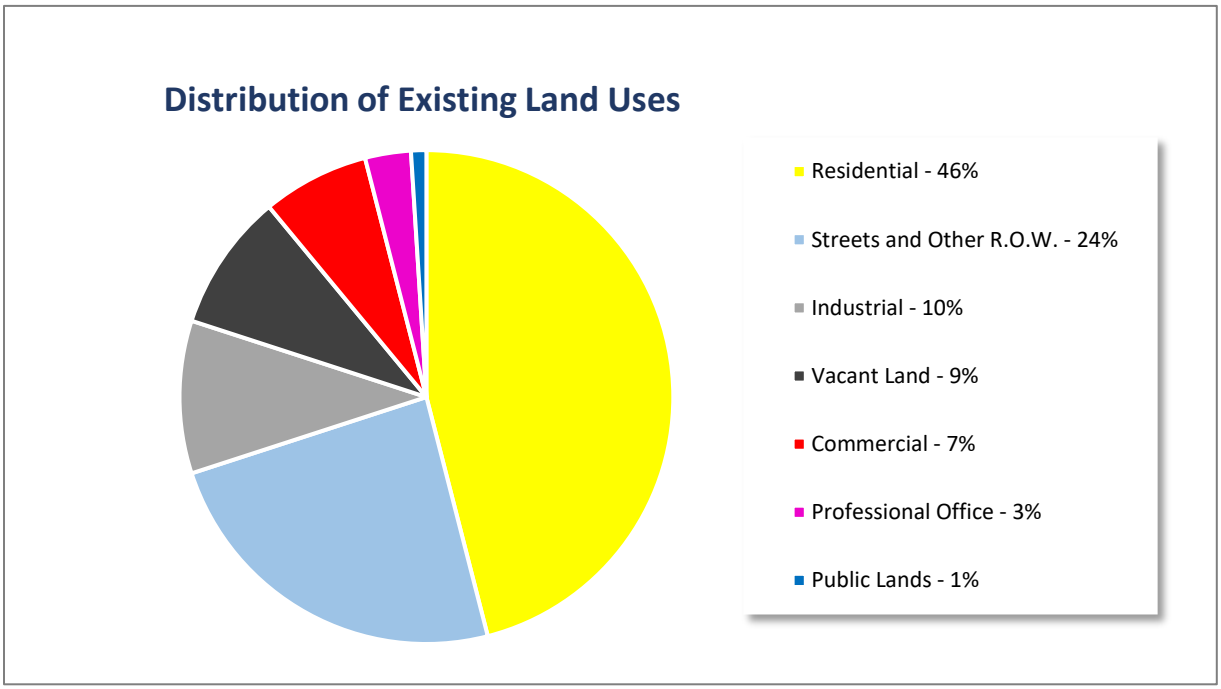
Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA's Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural disasters identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

The cost of natural hazards recovery can place an unequal financial responsibility on the general population when only a small proportion may benefit from governmental funds used to rebuild private structures. Discussions about natural hazards that include local citizen groups, insurance companies, and other public and private sector organizations can help ensure that all members of the population are a part of the decision-making processes.

2.7 LAND USE PATTERNS

Pomona is a highly urbanized city with a rich history that is reflected in its current development pattern and diverse mix of land uses, building types and styles, and neighborhoods. The City is almost entirely built-out with only 9 percent vacant land and a 1 percent of public lands. The distribution of existing land uses is shown in **Figure 2-3 Current Distribution of Existing Land Use**.

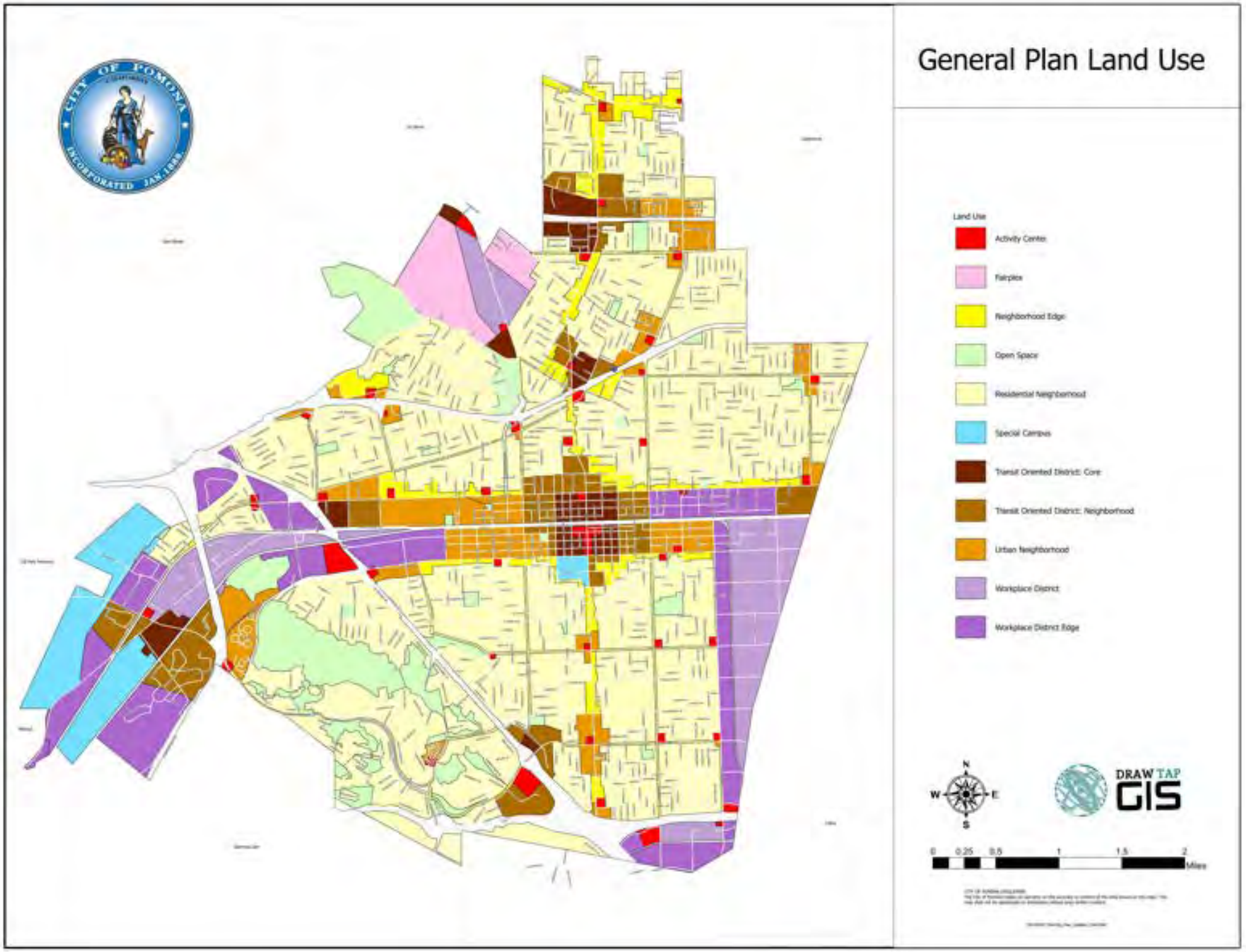
Figure 2-3: Current Distribution of Existing Land Use



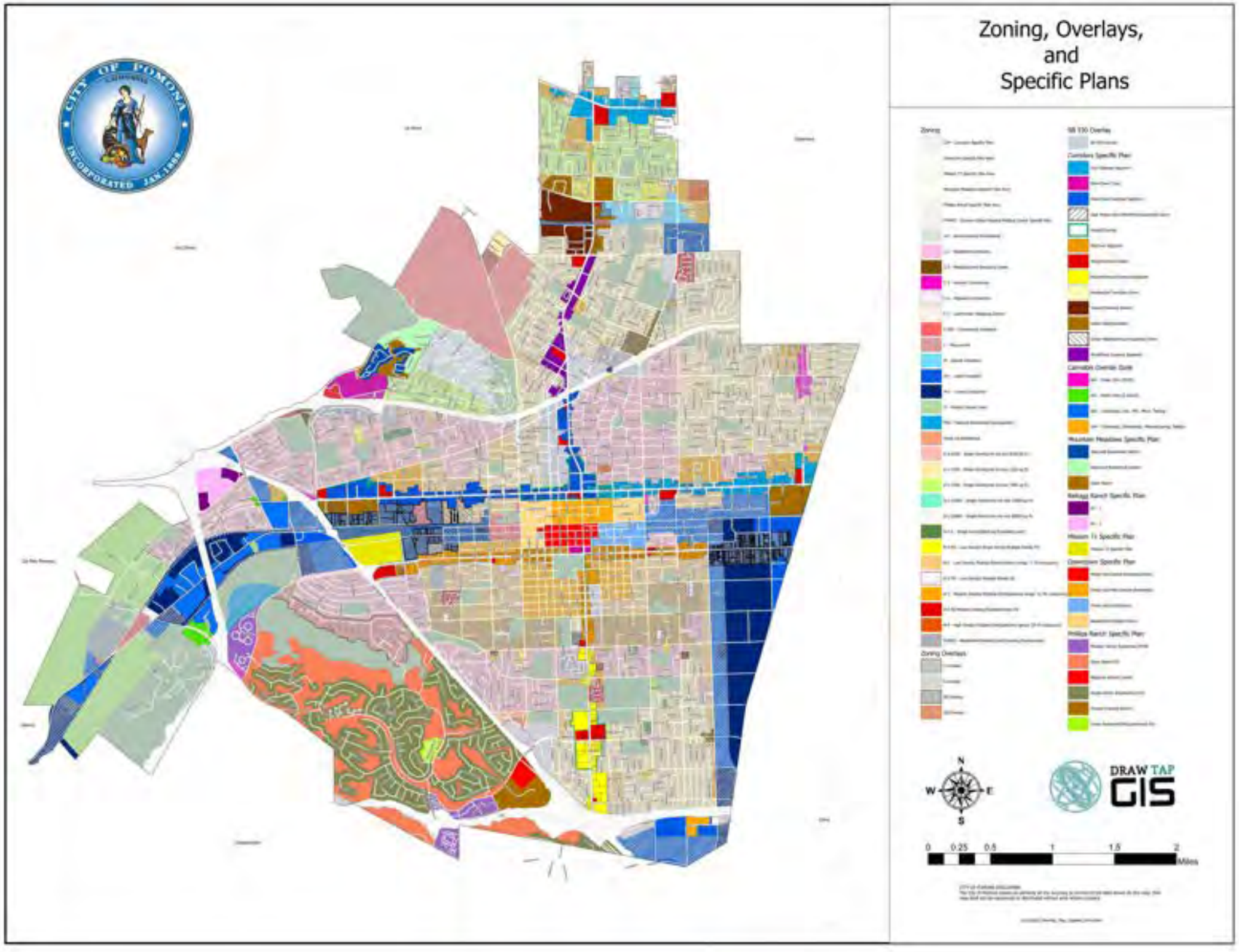
Above. Information provided by City staff June 2022.

Overall, Pomona's development pattern is typical of a city of its age, topography, and western U.S. location. Even in the city center, topography and lack of physical constraints has allowed for a relatively uniform street grid with residential neighborhoods and commercial corridors radiating outwards from the traditional mixed-use downtown core. Residential neighborhoods located further away from the downtown and along the hillsides to the north and south were built later in the 20th century and are more uniformly residential in use. At the western and eastern edges of Pomona, large industrial areas have developed with access to the railway and major transportation arteries.

Map 2-1: General Plan Land Use Map



Map 2-2: Zoning, Overlays, and Specific Plans Map



2.8 HOUSING AND COMMUNITY DEVELOPMENT

Although the cost of housing in Pomona is increasing and there is a lack of vacant land for new single-family residential homes, the mix of housing types has remained relatively consistent in recent years. Single-family residential is the primary housing type (69.5 percent of the total), with the remainder consisting of multi-family (26.2 percent) and mobile homes or other (4.3 percent). The majority of homes in Pomona are owner-occupied (57.4 percent of non-vacant units). The remaining 42.6 percent are renter- occupied. In order to increase the availability of housing units and meet its RHNA allocation, Pomona has adopted several ordinances, specific plans, and overlays to increase densities in the remaining developable land in the city.

Pomona has an older central district established during the City's early years of development, but what is not as readily apparent in the housing age statistics is the disparity of maintenance in many Pomona neighborhoods. While some of Pomona's older neighborhoods are remarkable for their largely excellent condition, there are also many areas that have become dilapidated. The condition of many of the City's older homes requires significant investment in renovation to bring them up to contemporary standards. The risk of property damage and injury is heightened in areas of older homes. To address housing issues, Pomona's Housing Division provides a number of programs including rental assistance, homebuyer mortgage assistance, housing rehabilitation, and facade improvement programs.

Overall, Pomona's annual median household income (2019) of $67,202 was about 7.6 percent less than the countywide average. About 15 percent of Pomona households earned an average annual income of less than $25,000.

2.9 EMPLOYMENT AND INDUSTRY

Pomona's job base is undergoing changes initiated by the closure of aerospace and manufacturing facilities in the late 1980s and early 1990s. Although the loss of large employers such as General Dynamics has had a negative impact. The COVID 19 pandemic has also significantly increased the unemployment rate in Pomona, particularly in the service industries, though the unemployment rate was highest between the months of March through July of 2020 and have already started to rebound.

Although employment growth has been negative, there have been other impacts from the job base changes. With the loss of major employers, Pomona has seen an increase in the diversity of job types and a shift to a wider range of smaller enterprises. This presents a challenge in coordinating with major employers to ensure the safety and welfare of workers and limit damage to industrial infrastructure. There is also a need to increase the number of high paying jobs.

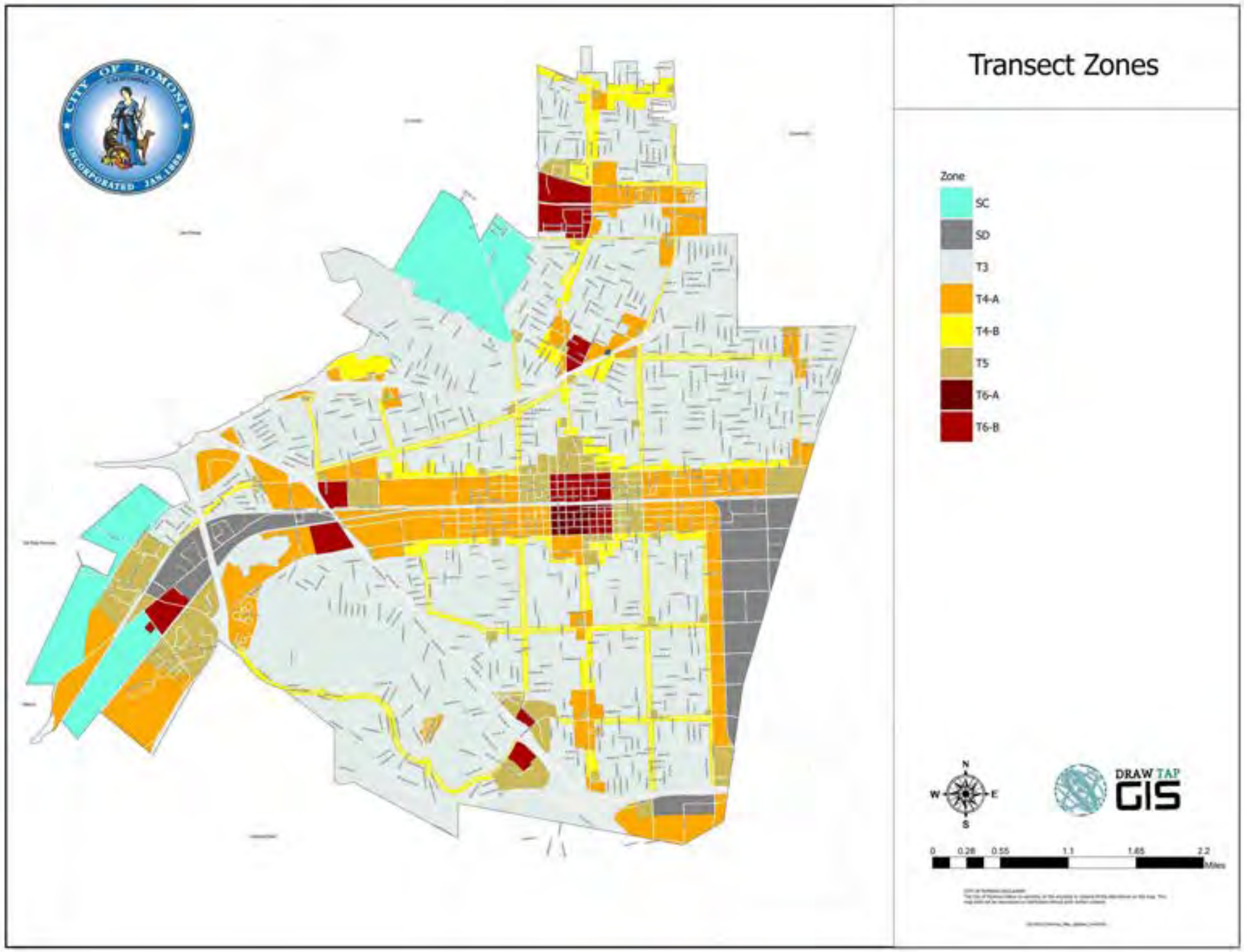
2.10 GROWTH AND DEVELOPMENT

As discussed in **Chapter 1 Introduction**, Pomona is located at the boundary of the highly urbanized metropolitan counties of Los Angeles and San Bernardino. It is surrounded and contained by the cities of Claremont, La Verne, San Dimas, Walnut, Diamond Bar, Chino, and Montclair. Within Pomona, all of the large land areas are developed, including most of the more remote hillsides. The remaining undeveloped land is either not suitable for development or has been set aside to remain as open space.

Although the City is considered built-out, development continues and is expected to continue to meet market demand created by population growth. Because there is a lack of available land suitable for development, new development will be primarily infill, reuse, and intensification.

Addressing the challenge of accommodating projected growth within the urban fabric of the City is a major goal of the 2014 *General Plan.* As part of this effort, a comprehensive assessment of areas in the City with potential for infill development, redevelopment, land use change, and/or development intensification has been conducted. The results of this assessment have resulted in the formulation of Transect Zones, which depict future density and intensity patterns that the General Plan identified the City could accommodate, as shown in **Map 2-3**.

Map 2-3: Transect Zones



Addressing the local hazard mitigation issues in an urbanized City like Pomona are different from those encountered in a community with room to expand outward. Due to its built-out status, future growth in Pomona will not stretch into undeveloped areas that could present additional natural hazard risks; rather, development will be integrated int o the existing urban fabric and affected by the same natural hazards that face the community in its present state. Challenges involved in mitigating risks associated with infill development primarily include concerns about the increase of risk from higher densities, some in already overcrowded neighborhoods. However, redevelopment also creates the opportunity to upgrade or replace older building stock with new construction that conforms to modern building codes. These include regulations for structural resistance to earthquakes, landslide mitigation efforts, fire-resistant materials, and elevation above flood levels. From a hazard mitigation perspective, through the replacement or renovation of older structures and infrastructure, infill and redevelopment can increase the City's safety significantly.

The primary way to mitigate hazard impacts on future development is to create hazard resilient development and infrastructure. Policies formulated in this document address this need and are discussed in detail in **Chapter 11 Mitigation Action Plan**.

2.11 TRANSPORTATION AND COMMUTING PATTERNS

TRANSPORTATION INFRASTRUCTURE

Pomona is centrally located within the greater Los Angeles-San Bernardino-Riverside region. As such, the City is traversed by a number of key regional transportation routes, notably the five major freeways and two rail lines that provide passenger and freight access and connect Pomona with the Inland Empire, Los Angeles and Orange County (see **Figure 2-4 Transportation Network**). In addition, Ontario International Airport, located just ten miles to the east, has established itself as a major gateway to the region, serving approximately six million passengers annually.

The well-developed street system in the City provides access to and from the regional facilities described above and accommodates travel for various modes of transportation (automobiles, trucks, buses, bicycles, and walking). The local system and regional access provide many opportunities for Pomona residents to travel within their city and region, and well beyond. The road system is also complimented with service from three transit agencies (Los Angeles County MTA, Foothill Transit, and Omni Trans) and two lines of the Metrolink commuter rail system.

Figure 2-4: Transportation Network



The five major freeways provide east-west, and north-south access as follows:

- The San Bernardino Freeway (I-10) and the Pomona Freeway (SR-60) provide east-west access to Pomona from Santa Monica and Los Angeles to the west, and Ontario, San Bernardino, and Riverside to the east. The Foothill Freeway (I-210) provides an additional east- west connection to the north of Pomona, extending west to Pasadena and the San Fernando Valley.
- The Corona Expressway (SR-71) and Orange Freeway (SR-57) provide connections with Corona and Orange County.

Figure 2-5: Pomona Street Classification System



The City's 296-mile road system includes 28.2 miles of major arterials, 45.8 miles of minor arterials, 36.7 miles of collector roads, and 184.4 miles of local roads. **Figure 2-5** shows the local network of arterial collector, and local streets, which is generally organized as a traditional grid.

Overall, traffic volumes are quite high in the City. In places, Temple Avenue carries close to 33,000 vehicles per day, while seven other arterials carry in excess of 20,000 vehicles per day. Most other arterials carry between 10,000 and 20,000 vehicles per day, while all collectors for which data is available, carry less than 10,000 vehicles per day. As traffic volumes rise, there is an increased risk that a natural hazard event will disrupt the travel plans of residents across the region, as well as local, regional and national commercial traffic.

In addition to the transportation access for residents, Pomona is well located for goods transportation. In addition to the freeways, two major rail lines traverse the city, including the Alameda Corridor East, which links Pomona to the Ports of Los Angeles and Long Beach.

TRENDS AND ISSUES

Although there are many routes traveling through or near Pomona, population growth in the region, particularly in the fast-growing Inland Empire area, has put a considerable strain on the regional freeways serving the City. Transportation patterns have become more complex, as the traditional "suburb to central city" journey to work has been replaced by multi-directional travel patterns due to job growth in dispersed locations. Vehicle and rail volumes are increasing in the area. Freeway congestion has become an acute problem in the region. In Pomona, there are significant level of service deficiencies along I-10, at the interchange of I-10, SR-57, and SR-71.

The amount of rail traffic through Pomona is also substantial, roughly 80 freight trains per day. This number is expected to increase following improvements to the Alameda Corridor, which includes the Union Pacific Railroad, potentially up to 151 trains per day. This is a serious concern for the hazards mitigation planning effort in that only three grade separated crossings are in place for local traffic and emergency vehicles to cross the Alameda Corridor. However, the Alameda Corridor East project does provide for improvements in Pomona including median improvements, traffic signal improvements, construction of new sidewalks and construction for two new grade separations, one at East End Avenue and one at Temple Avenue.

3 Risk Assessment

3.1 INTRODUCTION

The critical step in hazard mitigation planning is comprehensive risk assessment. This involves first understanding the types of hazards that could occur in the City, and then determining the range of risks to the community from each of the hazards. Mitigation is then formulated to avoid or reduce the identified risks, thereby facilitating a safer and more resilient environment for residents and business when implemented. This chapter overviews the risk assessment process, including documentation of the approach employed in the LHMP planning process in Pomona, description of critical facilities and vulnerable populations, and summary of the identified risks.

3.2 APPROACH

The approach employed for risk assessment for the Pomona LHMP was designed to identify all possible risk scenarios, determine the potential impact to the community associated with each risk, and then accordingly prioritize risks having greater potential impacts to be targeted in the mitigation actions. The steps in this process, conducted in coordination with the Technical Advisory Committee (TAC) and with input from community members, included:

- Determination of hazard threats in Pomona by way of researching existing databases and discussions with the TAC, a process that resulted in focusing the Pomona LHMP on 1) earthquake-induced ground shaking, liquefaction, and landslide, 2) wildfire, 3) flooding, 4) windstorm, and 5) pandemic/infectious disease (see **Section 3.3** below and **Chapters 4 to 9**);

- Hazard identification and profiling, including documentation of the geographic extent, potential intensity, and the probability of occurrence of the local hazard with potential to affect Pomona, using the best available data (see **Chapters 4 to 9**). As an update from the last plan, consideration of the impacts of climate change on each of these hazards was also included in the plan update;

- Inventory of critical facilities, defined as services and infrastructure that are essential to emergency response and community function: examples include fire and police services, hospitals, circulation, and water and sewer systems (see **Section 3.4**);

- Inventory of vulnerable populations, defined as people who are particularly susceptible to impacts of a local hazard event and may have special post-disaster needs: examples include populations in schools, childcare facilities, and overcrowded neighborhoods (see **Section 3.5**);

- Consideration of risk scenarios for critical facilities and vulnerable populations utilizing the hazard information on extent, intensity, and probability;
- Rating risk scenarios according to potential impact on the community, with consideration of geographic extent, potential for disruption of emergency and essential services, duration, and potential for population injuries, fatalities, and/or dislocation (see **Chapters 4 to 9**); and
- Risk analysis, involving quantification of vulnerabilities in terms of dollar losses, where appropriate data was available (see **Chapters 4 to 9**).

3.3 LOCAL HAZARDS ANALYSIS

Pomona is potentially subject to risks associated with earthquakes, landslide, wildfire, flooding, windstorm, and pandemics/infectious disease. The greatest local hazard threats with potential for widespread injury, life loss, property damage, and prolonged disruption in Pomona are ground shaking and liquefaction associated with a major earthquake. Pomona is located in a seismically active region of Southern California, with several damaging earthquakes having occurred just in the past twenty years.

Important but potentially less destructive hazard threats (due to more limited geographic extent) include landslide associated with steeper slopes and wildfire associated with the remaining open spaces. Flooding occurs in some limited areas occasionally disrupting circulation arterials, and there is a risk- albeit very low- of flooding from dam inundation. Windstorm conditions resulting from strong seasonal Santa Ana winds occur, but the impact to the community is low relative to the potential impacts of other local hazard events.

At the time this plan update is being written, Pomona and the rest of the world are in the midst of a global pandemic caused by the Covid-19 virus. The pandemic has had far reaching health, social, educational, and economic impacts. This plan update incorporates a chapter specifically on pandemics/infectious disease.

Also new to this plan update is specific discussion of the implications of climate change on each hazard, contained within the hazard profiles.

Complete local hazard descriptions which include hazard identification and profiles, maps, and potential risks-are set out in separate chapters as follows:

- Chapter 4: Earthquake
- Chapter 5: Landslide
- Chapter 6: Wildfire

- Chapter 7: Flooding
- Chapter 8: Windstorm
- Chapter 9: Pandemic/Infectious Disease

3.4 CRITICAL FACILITIES

Following a local hazard event, the primary goals of the City emphasize maintaining services that are key to the functioning of Pomona. By identifying critical facilities that lie within potentially hazardous areas, the City can help to prepare for and minimize debilitating impacts on these services. The following is an overview of the critical facilities in Pomona. With the exception of utilities, which have been omitted for security purposes, the critical facilities are mapped in **Figure 3-1**.

GOVERNMENT EMERGENCY OPERATIONS FACILITIES

Maintaining the continuity of government during a local hazard event is essential in order to respond to emergencies, protect life and property, and recover in the aftermath of an event. The City of Pomona has formulated a comprehensive strategy to ensure proper functioning of the government during a crisis. This strategy is laid out in the City's *SEMS* (Standardized Emergency Management System), part of the City's Emergency Operations Plan. The SEMS designated several sites as centers of emergency operation, communication, and governance during an emergency. Alternates for these facilities are also designated, in the event that the original facility is not operational. As shown in **Figure 3-1**, the majority of these facilities are centrally located in downtown Pomona, which is the " hub" of government emergency operations. Also located in close proximity, and in some instances serving as government operations facilities, are the headquarters of the Police and Fire Departments that serve the City.

EMERGENCY SERVICES

Police Services

The Pomona Police Department provides local police services for the City of Pomona. The primary facilities include the main headquarters and jail, the training bureau, the traffic bureau, and an aero bureau, which is located at Brackett Field in the City of La Verne. Pomona Police Department headquarters are located at 490 W. Mission Boulevard.

Fire Services

The Los Angeles County Fire Department (LACoFD) serves the City of Pomona. Pomona is part of the LACoFD Division VIII, located on the eastern boundary of the Department's jurisdiction. In addition to the City of Pomona, Division VIII includes the neighboring cities of Diamond Bar,

Walnut, Industry, La Puente, and the unincorporated communities of Avocado Heights, Bassett, Hacienda Heights, Rowland Heights, and Valinda. Seven of the 19 fire stations in Division VIll are located in Pomona. If necessary, resources in the City's adjacent jurisdictions provide additional support.

Fire stations are strategically located throughout the City to provide prompt assistance to area residents. Each fire station operates with in a specific district that comprises the immediate geographical area around the station. Approximately 83% of the City is located within a one-mile radius of a fire station in Pomona. Division headquarters are located in Diamond Bar and Battalion 15 headquarters are located at 590 S. Park Avenue, at Station 181.

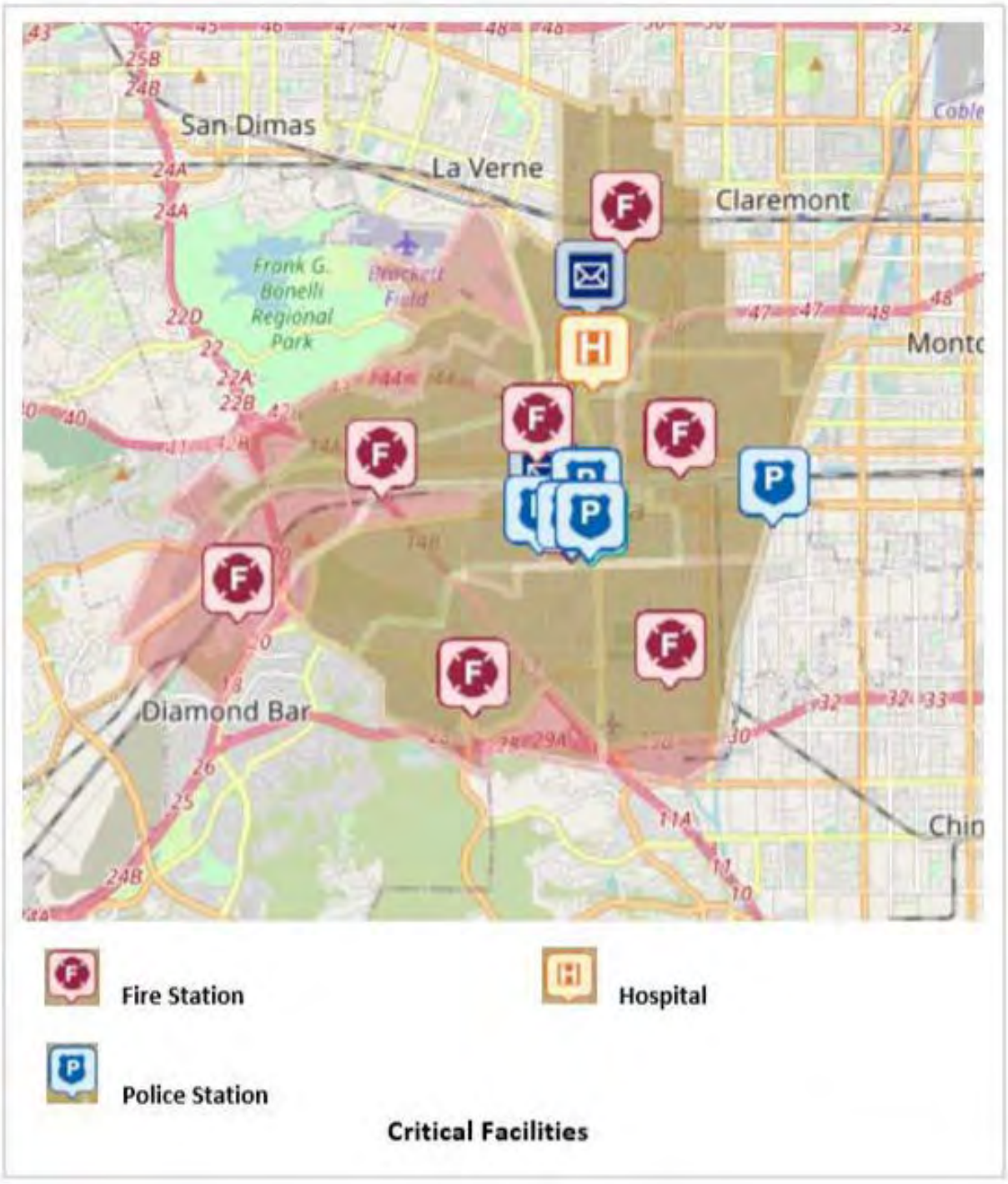
HOSPITALS

There is one major critical health care facility in Pomona, the Pomona Valley Hospital Medical Center. This facility is located at 1798 N. Garey Avenue. In addition to Pomona, it serves Eastern Los Angeles and Western San Bernardino Counties. It contains 412 beds, 70 emergency beds, and offers a complete range of medical services including general medical and surgical care, general intensive care, cardiac intensive care, open heart surgery, neurology, pediatrics, obstetrics, and neonatal intensive care. A staff of 700 physicians, 3,700 employees and more than 1,000 volunteers manage over 85,000 inpatient days, 5,000 newborn deliveries, and more than 75,000 ER patient visits.[4]

Two other hospitals serve the City of Pomona: Casa Colina Hospital for Rehabilitative Medicine and American Recovery Center. However, these facilities provide specialized care to treat specific illnesses, and would not be primary providers of emergency medical aid in the event of a disaster. A further discussion of these hospitals is presented in the following section on vulnerabilities. Other facilities, such as the county-operated Pomona District Health Center and the East Valley Community Health Center, provide important primary care services, but due to their limited size and services are not considered critical or vulnerable facilities for the purposes of this plan.

[4] *Correspondence with PVHMC staff, September 2021.*

Figure 3-1: Critical Facilities



TRANSPORTATION

There are five major freeways serving Pomona that provide primary regional access to and from the City. The I-10 and SR-60 freeways provide east west access to Pomona from Santa Monica

and Los Angeles to the west, and Ontario, San Bernardino and Riverside to the east. The I-210 freeway provides an additional east west connection to the north of Pomona, extending west to Pasadena and the San Fernando Valley. The SR-71 and SR-57 freeways provide connections with Corona and Orange County.

In addition to the five freeways passing through the City, Pomona has an extensive street network. Classified as arterials, collectors, and local roads, Pomona's roads carry many thousands of vehicle and transit trips daily. Pomona's street network is primarily based on a grid, with several major north-south and east-west roadways interlaced with a system of intersecting minor streets.

Three railroads currently cross Pomona, which generally run east-west. Two railroad lines, located in the center of the City, are operated by Union Pacific Railroad (UPR) and are part of the Alameda Corridor. One of these lines was formerly the Southern Pacific Line (SPL) and is still marked as and commonly referred to under that name. The UPR tracks carry both freight and passenger trains. The northernmost railroad tracks were formerly operated by Atchison Topeka and Burlington Northern Santa Fe Railroad (BNSF). They are currently owned by the Los Angeles County Metropolitan Transportation Authority, which operates passenger trains on the line (Metrolink).[2]

The UPR located roughly between Holt Avenue and Mission Boulevard, bisects the center of the City and could be a significant impediment to north-south transportation if a train derailed within the City. Damage to the UPR tracks would also have far-reaching economic effects; the line is a major regional freight transportation artery. The location in Pomona is one through which all eastbound and westbound rail traffic must pass in Southern California. As part of the Alameda Corridor, the UPR will experience substantial structural improvements and increases of train traffic in the future.

A light rail passenger train extension of the Gold Line is currently under construction. The current phase will extend the Gold Line from Glendora to Montclair. Construction is currently underway through the cities of Glendora, San Dimas, La Verne, and Pomona, and the line extension is anticipated to be operational in 2025. Once completed, four and five tracks will run through the city of Pomona (depending on the location in the city). Tracks will run in two separate rail corridors – one on the north for the Gold Line and freight, and one on the south for Metrolink and freight. While Gold Line trains and freight trains share the northern corridor, they will not share tracks. Therefore, the freight tracks that currently run in the middle of the north corridor will be relocated to the northern half of that corridor, to make room for the Gold Line tracks to be built in the southern half. The Metrolink/freight corridor on the south will remain as is today and is not part of the Gold Line project.[5]

Each of the highways, freeways, and railroads are considered critical facilities in Pomona. A

[5] *https://foothillgoldline.org/cities_stations/pomona/, accessed September 2021.*

hazard that rendered these routes impassible would pose a significant challenge to the City in responding to and recovering from the event.

UTILITIES

Pomona is a large city, 23 square miles in size, and it is traversed by hundreds of miles of streets, transmission lines, pipelines, and other facilities that enable proper functioning of the utility systems that serve Pomona. Although each of the parts contribute to the health of these systems, it is infeasible to detail every component involved in Pomona's utility networks. This section, therefore, provides a brief description of utility services in the City, then summarizes the few critical facilities that contribute most to proper system functioning.

Water

The City of Pomona adopted a Water Master Plan in 2005 and subsequently adopted an Integrated Water Resource Management Plan in 2011.

The 2005 Water Master Plan indicated that the existing potable water system consisted of approximately 421 miles of pipelines, 22 storage reservoirs, 15 booster pumping stations, 41 groundwater wells (38 potable, 3 recycled), 4 imported water connections, 2 inter agency connections, 5 water treatment plants, 28 pressure regulating stations, 6,000 fire hydrants, and 11 pressure zones.[6]

Sewer

Wastewater service within Pomona is provided by the City's Utility Service Department, and the Los Angeles County Sanitation District (LACSD) treats wastewater from the City's system. A majority of the City's wastewater is treated and disposed of at the LACSD's Pomona Water Reclamation Plant (PWRP).[7] The plant occupies approximately 14 acres northeast of the intersection of the SR-57 and SR-60 Freeways. Sewage effluent from the neighboring cities of La Verne and Claremont is also treated at the PWRP.[8]

The City of Pomona adopted a Sewer System Master Plan in 1990 and updated the plan in 2005. The Sewer Master Plan indicates that the City provides sewer service throughout the City, approximately 14,680 acres, and to a limited area outside the City limits, approximately 6 acres. Approximately 2,000 acres in the City drain to other serving entities or currently produce no sewage.

The City's sewer system consists of approximately 300 miles of gravity sewer, four pump stations, 1.4 miles of force mains, and 4,600 manholes. The one known siphon in the City's system is

[6] https://www.pomonaca.gov/home/showpublisheddocument/536/637457868354570000, *accessed November 20, 2021.*
[7] https://www.lacsd.org/services/wastewater-sewage/facilities/pomona-water-reclamation-plant, *accessed November 20, 2021.*
[8] https://www.pomonaca.gov/home/showpublisheddocument/542/637457870725430000, *accessed November 20, 2021.*

located at 4200 West Valley Boulevard and was installed in the early 1960s to convey wastewater across the San Jose Wash.

Solid Waste

The City of Pomona Utility Services Department provides trash, recycling, and special pickup services for single-family residences, duplexes, triplexes, and some fourplexes. Franchise commercial waste haulers provide trash and recycling service for most fourplexes, all apartments with five or more units, as well as all commercial, governmental, and industrial facilities. Solid waste is transported to transfer stations for sorting and shipping to landfills; no transfer stations serving Pomona are located in the City.

Electricity

Southern California Edison Company is the primary distribution provider for electricity in the City. The power received by the City's residents is produced at the various generation plants located throughout the region. Upon leaving the plant, electricity is distributed to individual users via local distributing stations, located within and around the City. The four substations and two primary transmission lines in Pomona are considered critical facilities.

Natural Gas

Currently, Southern California Gas Company maintains transmission and distribution lines throughout the City. Most lines operate at a medium pressure of approximately 30 to 60 pounds per square inch (psi), except for those located in the industrial areas that require higher pressures.

3.5 VULNERABLE POPULATIONS AND FACILITIES

Local hazards will not equally affect all areas and populations of Pomona. Identifying the vulnerable populations and facilities in the City will help to avert damage and prepare the City to provide extra assistance to those who will need it. Facilities that support vulnerable populations are described below and depicted geographically in **Map 3-1**. Facilities that have particular vulnerabilities to specific hazards are discussed in further detail in the relevant hazard chapters (**Chapters 4 to 9**).

SCHOOLS AND DAY CARE CENTERS

Children are the primary vulnerable group in Pomona. Minimizing damage to schools and daycare facilities will help ensure their safety during a local hazard event. Preparing schools for local hazards not only helps prevent harm from coming to the children of Pomona; the schools can

also be used as critical facilities following a local hazard event. During and after times of crisis, schools can be utilized to serve as mass care facilities and important centers of information and communication.

Public Schools

The Pomona Unified School District (PUSD) operates 41 schools within the City, which are mapped on **Map 3-1**. Two of PUSD's schools are located in Diamond Bar and, thus, serves a portion of that City's population. There are currently 21 elementary schools (grades K-6), 5 K-8 schools, 4 middle schools, 8 high schools (grades 9-12), and 3 other schools within the PUSD. Approximately 24,062 students attend PUSD schools, and the district is one of Pomona's largest employers.[9]

Private Schools

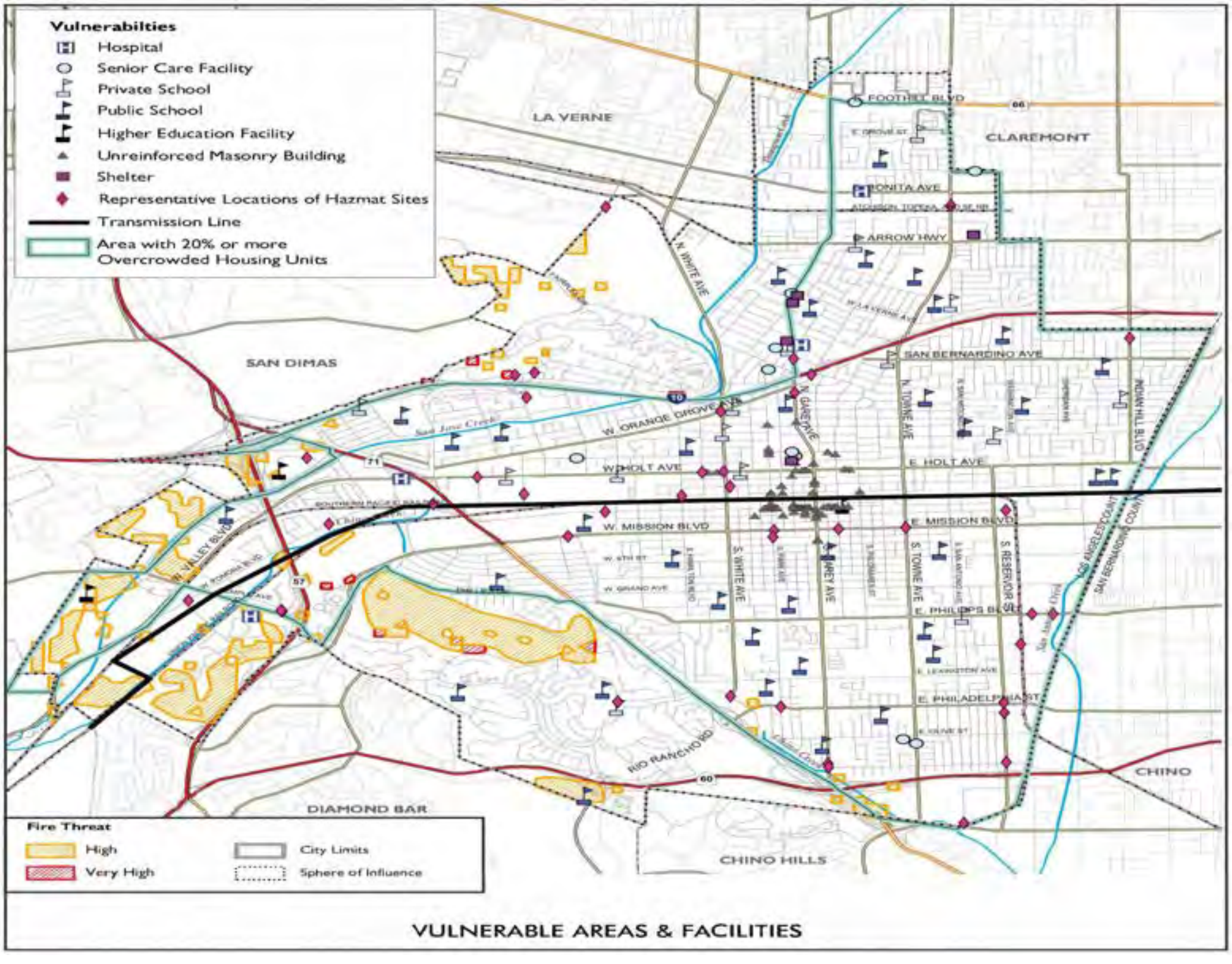
The City of Pomona has a number of private schools, including but not limited to St. Joseph Elementary School, Pomona Catholic Middle School and High School, American Christian Academy, and City of Knowledge. Locations of some of the larger private schools are depicted in **Map 3-1**.

Childcare Centers

There are 41 commercial day care providers in Pomona, which are considered greater vulnerabilities due to the larger number of children present at their facilities.[10] The locations of the commercial childcare centers are mapped in **Map 3-1**.

[9] *https://proudtobe.pusd.org/apps/pages/Facts, accessed August 28, 2021.*
[10] *https://www.ccld.dss.ca.gov/carefacilitysearch/Search/ChildCare, accessed September 21, 2021.*

Map 3-1: Vulnerable Facilities Map



Universities

There are several institutions providing higher education in Pomona. The largest of these is the California State Polytechnic University (Cal Poly Pomona). This University is located adjacent to the City's western border, mostly in unincorporated lands, but owns some land within city limits. Cal Poly Pomona employs more than 2,675 people and has an approximate enrollment of 27,915 graduate and undergraduate students.

Western University of Health Sciences (Western U) is located in downtown Pomona. Its main campus is at 309 E. 2nd Street. Western U opened a secondary campus in Oregon in 2017. At its Pomona campus, the University employs roughly 1,100 people and current enrollment is approximately 3,800 students.[11]

RECREATION AND COMMUNITY CENTERS

Approximately 25% of Pomona's population is younger than 18 years of age.[12] There are several recreation and community centers in the City that help to provide services to its young residents. These facilities also provide important services to seniors as well. Especially during after-school hours, these centers can become crowded with youth. The City operates community centers at six of its parks, as well as the Pomona Boys and Girls Club. There is also a YMCA in Pomona, which has served the community since 1884. The original YMCA building, completed in 1922, is also listed in the National Register of Historic Places and Pomona's Local Landmark Register. The facility was closed in 2012 and the existing building is currently approved for redevelopment.

SENIOR CARE FACILITIES

In addition to the care available at hospital facilities, seven senior care centers are located in Pomona. The residents of these facilities may require additional medical attention, transportation assistance, emergency housing, or other assistance following a local hazard event. Most senior fare facilities in Pomona are located north of Holt Avenue, and several are clustered along the Garey Avenue corridor.

HOSPITALS

Hospital facilities house large numbers of vulnerable patients who may need additional assistance in the event of an emergency. All of the hospitals in Pomona, including PVHMC, are considered assets with vulnerabilities. In addition, there are two other hospitals that serve as specialized treatment centers in Pomona: Casa Colina Hospital for Rehabilitative Medicine and Behavioral Health Services (BHS) - American Recovery Center. Information on PVHMC is provided in **Section 3-4**; Critical Facilities, and information about the remaining two hospitals is supplied

[11] https://www.westernu.edu/publicaffairs/news/fact-sheet/, *accessed August 28, 2021.*
[12] https://www.census.gov/quickfacts/fact/dashboard/pomonacitycalifornia/AGE295219, *accessed September 4, 2021.*

below.

Casa Colina Hospital for Rehabilitative Medicine

Casa Colina Hospital is an acute and sub-acute care hospital providing medical rehabilitation services. The hospital serves children and adults who have been disabled by spinal cord injury, brain injury, stroke, chronic lung disease, back injury, chronic pain, orthopedic conditions, neurological and neuromuscular disorders, developmental disorders, and other illnesses or injuries. The facility is located at 255 East Bonita Avenue and has 64 beds, a staff of 184 physicians, and 27 full-time staff nurses.

BHS - American Recovery Center

Behavioral Health Services is a not-for profit community-based healthcare organization providing medical services, substance abuse, mental health, drug-free transitional living, housing for women with HIV, and prevention services in Los Angeles County. BHS operates 21 locations, covering the South Bay, East Los Angeles, the San Gabriel Valley, and the metropolitan areas of LA County.[13] BHS – American Recovery Center located at 2180 Valley Boulevard in Pomona, provides 10 – 14 day medically assisted detox services with 24-hour medical supervision, 3 – 9 months intensive outpatient services, and 3 – 6 months inpatient services, depending on the client's needs.

SHELTERS

There are four shelters and transitional living facilities in Pomona identified by the City's department of Community Services. Such group living quarters are considered vulnerabilities because of their concentrations of people with special needs and limited resources. The potential for loss of life is much higher in the event of structural failure/building collapse. In addition, due to the limited financial resources of the inhabitants in these shelters, the residents may require special post-disaster assistance, in particular relocation assistance.

HAZARDOUS MATERIALS

Following a local hazard event, hazardous materials could potentially harm Pomona residents by exposing them to chemicals that may be poisonous, irritating, suffocating, or cause burns. The severity of hazardous materials impacts depends on many factors such as amount of chemical released, location, and rate and direction of dispersion. Identifying vulnerable toxic sites and preventing hazardous materials spills before they occur is fundamental to mitigating the myriad unpredictable impacts that such spills may have on the community.

Over 200 sites with exposed hazardous materials are located within the City of Pomona. These sites include leaking underground storage tanks (LUSTs), leaking underground fuel tanks (LUFT), and other hazardous materials sites that are listed by the California Department of Toxic

[13] *https://www.bhs-inc.org/, accessed December 8, 2021.*

Substances Control (DTSC). In order to address the primary hazardous waste vulnerabilities most efficiently, only the most acutely hazardous materials were mapped in **Map 3-1**. There is one location listed as a Federal Superfund site by the Environmental Protection Agency (EPA), under the Superfund Amendments and Reauthorization Act (SARA), Title III, and one Hazardous Waste and Substances (Cortese List) Site.[14] Of the many hazardous materials sites in the City, these represent the greatest threat to human and environmental health in the City if released.

In addition to stationary hazardous materials sites, hazardous material that is enroute to other locations via truck or train may also be present in Pomona at any given time. Restrictions placed on transporters of hazardous materials include the avoidance of heavily populated areas, unless no other satisfactory route exists, limitations on access to bridges and tunnels, and a one-mile-wide zone limitation along freeways for access to fuel and services. Railroad regulations stipulate that explosive materials are controlled within the train, but there are no controls regarding train routes. The only restriction is that potential flammable or explosive materials cannot be any closer than six rail cars from the train locomotive. This exposes neighborhoods near railway tracks in Pomona to potential hazards due to rail car derailment and hazardous spills.

UTILITIES

Critical facilities of the utility systems in Pomona are discussed in the previous section, but it is important to note that there are specific vulnerabilities associated with them as well. Undergrounded utilities may be subject to rupture during an earthquake, creating the potential for fire or releasing hazardous chemicals. Additionally, strong winds are capable of downing tree branches that can fall on power lines, and fires can damage aboveground utility lines. Depending on the event, impacts can remain localized or affect the entire City. Specific utility vulnerabilities are discussed further in the relevant hazard chapters, when appropriate (see **Chapters 4 to 9**).

VULNERABLE DEVELOPMENT PATTERNS

Overcrowded Communities

The U.S. Census collects information about the density and level of crowding in housing units. A unit is considered overcrowded if it has more than one occupant per room. The area of the City with 20 percent or more of housing units that are overcrowded, per census tract, is displayed in **Map 3-1**. Areas with a large percent of overcrowded units may experience greater impact during local hazard events due to their higher population densities. Because overcrowding is closely correlated with lower income levels and housing values, it is reasonable to assume that overcrowded neighborhoods may contain greater numbers of deteriorated buildings prone to damage than in other parts of the City. Emergency responders should be prepared to spend relatively greater amounts of time in the overcrowded neighborhoods when responding to the effects of a major disaster. Furthermore, there may be a need for higher levels of post-disaster assistance, such as short-term housing.

[14] https://www.epa.gov/superfund/search-superfund-sites-where-you-live, *accessed December 2021.*

Unreinforced Masonry (URM) Buildings

Unreinforced masonry buildings (URMs) are structures that are particularly vulnerable to damage during an earthquake. These buildings generally constructed prior to 1933 predate modern earthquake-resistant design standards. URM buildings are made of brick and have not been reinforced with strengthening steel bars in the structure. The walls of these buildings are more likely to disconnect from the foundation and fall during ground shaking, creating debris hazards and sometimes total collapse of the structure. URM buildings in Pomona are depicted on **Map 3-1**. Many of these were damaged in the 2008 Chino Earthquake.

Historic Properties

First incorporated in 1888 as the fifth city in Los Angeles County, Pomona has an impressive inventory of historic properties. It includes eight properties listed on the National Register of Historic Places, five properties designated as California Historic Landmarks, and twenty-six properties designated locally on Pomona's Landmark Register, as well as two historic districts. There are several additional districts with potential historic significance and more than 500 potential historic properties under consideration for local, state, or national historic designation.

Many of these structures are particularly vulnerable to damage from hazards due to their age, construction methods, and materials. Many historic buildings were heavily damaged in the last major hazard event to affect Pomona, the Whittier Narrows earthquake. The City of Pomona owns three of the most historic properties, which date back to the first modern settlement of the site that later became Pomona.

Pre-1976 Structures

Seismic safety standards were first incorporated into Pomona's building code in 1976. Due to the considerable age of the City, however, the majority of the structures were constructed before such standards were in place. Historic structures and areas have been mapped in **Map 3-2**. The distribution of structures by age clearly displays the evolution of Pomona: the oldest buildings are clustered downtown - including the URM buildings discussed above - and development radiates outward over time from this core. In the vast majority of cases, pre-1976 buildings are not required to conform to seismic safety requirements and have an elevated risk to damage due to earthquake. Older structures are also more prone to wind damage.

Hazard-Specific Land Uses and Construction

In addition to other types of vulnerable development patterns discussed in this section, there are specific land uses and construction types that are more susceptible to particular local hazards. For example, soft-story and tilt-up construction tends to be more vulnerable to ground shaking. Development in the urban/wildland interface increases the risk of damage due to wildfire. These types of hazard-specific developments are discussed in further detail in **Chapters 4 - 9.**

Map 3-2: Designated Historic Resources



Source: Historic Resources Technical Report
July 18, 2012 - Architectural Resources Group

Designated Historic Resources

3.6 RISK IDENTIFICATION AND VULNERABILITIES SUMMARY

Identified risks and vulnerabilities associated with local hazards in Pomona are summarized below. **Chapters 4 - 9** document the analyses yielding these conclusions.

EARTHQUAKE

The following risks and vulnerabilities associated with ground shaking, liquefaction, and earthquake-induced landslides have been prioritized for mitigation actions:

- Many of the buildings in Pomona were constructed before seismic safety standards were implemented in 1976; this includes a majority of the facilities that house emergency services and government operations.
- There are dozens of unreinforced masonry buildings, which are well-known for their poor ability to withstand earthquakes. They are especially prone to collapse and pose substantial risks to life and property.
- Historic properties are more prone to sustain damage and collapse during an earthquake. Historic structures and areas in Pomona are mapped in **Map 3-2**.
- Much of the utility infrastructure in Pomona is aging and will need maintenance or replacement. Critical components of the utility systems, such as water reservoirs, have partial seismic safety features in place but completion of retrofit programs has been deferred.
- Targeted transportation corridors have been identified as crucial and vulnerable lifelines, essential for emergency vehicle traffic. Collapse of underpasses or train derailment would impair proper provision of emergency services in the aftermath of an earthquake.
- Particular neighborhoods in Pomona have an elevated vulnerability to earthquake hazards due to the age of the structures, or due to a high percentage of overcrowding. Often these characteristics coincide; damage in these neighborhoods is expected to be relatively greater than the rest of the City and will require concomitant emergency response.

LANDSLIDE

The following risks and vulnerabilities associated with landslides have been prioritized for mitigation.

- Residential developments in the hills of Pomona are at risk to landslide. Not only are they built on areas that are historically prone to landslides due to topography and soil conditions, but road development, grading, excavation and other forms of development. (*4 homes were lost in a 2006 landslide in South Pomona*.)

WILDFIRE

The following risks and vulnerabilities associated with wildfire have been prioritized for mitigation.

- Development in the urban/wildland interface is especially vulnerable to wildfire damage. Communities such as Phillips Ranch and Ganesha Hills were built in these areas and require more stringent wildfire mitigation measures. Aging infrastructure in the City is vulnerable to damage from earthquake, which could affect the City' s water supply in the event of a wildfire.

FLOODING

The following risks and vulnerabilities associated with flooding have been prioritized for mitigation:

- A small number of locations in areas associated with flooding have been prioritized for mitigation. Pomona is prone to flooding due to storm drain deficiencies. The flooding that occurs seasonally at the railroad underpasses is of particular concern, as it has the potential to block routes that are considered key transportation lifelines. The City could be subject to flooding in the event of dam failure. However, due to the distance of the City from the reservoirs, the minimal amount of water that is stored at the relevant impoundments, and the very low probability of occurrence, this risk is not considered to have significant potential for widespread community impacts.

WINDSTORM

The following risks and vulnerabilities associated with windstorm have been prioritized for mitigation:

- Santa Ana winds which occur from October through March and can damage or dislodge roofs and topple trees and power lines. These windstorms can affect the entire city, but potential damage is not widespread and there are no high risks to critical facilities or city infrastructure. (*A windstorm in 2011 affected communities west of Pomona. Power was out for over a week due to tree damage.*)

PANDEMIC/INFECTIOUS DISEASE

The following risks and vulnerabilities associated with pandemics and infectious disease have been prioritized for mitigation:

- Protecting vulnerable populations has been prioritized. The health and safety of the public is threatened by pandemics/infectious diseases. As evidenced by the COVID-19 pandemic

all communities, regardless of density may be severely impacted by a pandemic/infectious disease. However, an emerging infectious disease or novel virus may impact have a greater impact on overcrowded communities, particularly where there is a clustering of older residential structures that may not meet current building standards and may not have adequate ventilation. It is also likely, and also evidenced by COVID-19, that vulnerable communities are particularly susceptible to more severe impacts of emerging infectious diseases and novel viruses due to higher comorbidity rates, and pollution exposure, as well as socio-economic challenges that may prevent a person from working from home or taking time off and isolating, if necessary. (*As of December 9, 2021, there were approximately 514 deaths attributed to COVID-19 in Pomona*).

- Protecting business operations in the City has been prioritized. Business and economic impacts may be severe. The City must be able to be flexible with the business community and provide easy pathways toward allowing businesses to continue operating while protecting the health and welfare of the public.

3.7 POTENTIAL FINANCIAL LOSSES

POTENTIAL DAMAGE ESTIMATES

A comprehensive assessment of the potential risks faced by a community involves understanding financial vulnerabilities in addition to prospects for injury, life loss, and property damage. Estimates of financial costs help to underscore the cost effectiveness of emergency preparedness and hazard mitigation actions and improvements. In addition, cost estimates calculated for separate hazard scenarios-earthquake, flooding, landslide, etc.- provide a quantitative tool for comparing hazard effects and prioritizing mitigation.

For each hazard where data were available, cost estimates of potential damage have been calculated. The primary tool available to estimate the potential losses of local hazard events is the GIS-based software HAZUS. A HAZUS scenario was constructed to estimate losses due to earthquake damage in the City; total potential losses exceeded 2.5 billion dollars. While these estimates are highly hypothetical, they nevertheless provide a sense of the magnitude of potential financial impacts.

4 Earthquakes

4.1 INTRODUCTION

California is home to the most intense and greatest number of earthquakes in the contiguous United States: of the 20 largest earthquakes in the contiguous United States, 10 have occurred in California[15]. The State also ranks number one in the nation in the amount of damage caused by earthquakes, in large part due to its high population and degree of urbanization[16]. The City of Pomona is no exception to the rest of the State, and the threat posed by an earthquake is considered the most significant hazard facing Pomona. This chapter provides information about earthquake hazards in Pomona, beginning with an overview of historic events and the probability of future earthquakes in Southern California, and then identifies specific areas of hazards and risks within the city.

4.2 HAZARD PROFILE

HAZARD DESCRIPTION

Generally defined, an earthquake is an abrupt release of accumulated energy in the form of seismic waves when movement occurs along a fault. The City of Pomona lies in a seismically active region of Southern California, with several major active faults in the area, including the San Andreas, Sierra Madre, and Whittier - Elsinore fault zones. However, in addition to these known faults, movement along buried blind thrust faults that have no obvious surface features can also occur.

Faulting and Seismicity

Earth scientists use the angle of the fault with respect to the surface (known as the dip) and the direction of slip along the fault to classify faults. Faults that move along the direction of the dip plane are dip-slip faults and described as either normal or reverse, depending on their motion. Faults that move horizontally are known as strike-slip faults and are classified as either right-lateral or left-lateral. Faults that show both dip-slip and strike-slip motion are known as oblique-slip faults. The types of faults are described below and illustrated in **Figure 4-1**:

- *Normal Fault.* A dip-slip fault in which the block above the fault has moved downward relative to the block below. This type of faulting occurs in response to extension and is often observed in the Western United States Basin and Range Province and along oceanic

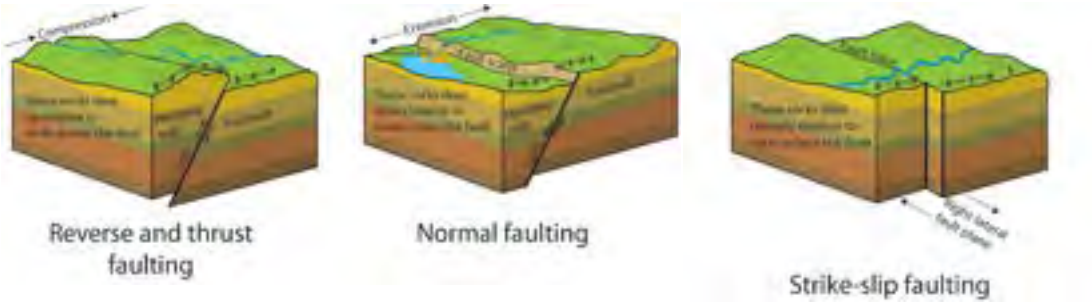
[15] *National Earthquake Information Center website: http://neic.usgs.gov/neis/eqlists/lOmaps_usa.html, accessed September 13, 2021.*
[16] *USGS Earthquake Hazards Program website: http://earthquake.usgs.gov/faq/hist.html#5, accessed September 13, 2021..*

ridge systems.

- *Thrust Fault*. A dip-slip fault in which the upper block, above the fault plane, moves up and over the lower block. This type of faulting is common in areas of compression, such as regions where one plate is being subducted under another. When the dip angle is shallow, a reverse fault is often described as a thrust fault.

- *Strike-Slip Fault*. A fault on which the two blocks slide past one another. A left lateral strike-slip fault is one on which the displacement of the far block is to the left when viewed from either side. A right lateral strike slip fault is one on which the displacement of the far block is to the right when viewed from either side. The San Andreas Fault is an example of a right lateral strike-slip fault[17].

Figure 4-1: Types of Faults



4.2.1 HISTORIC EVENTS

Although damaging earthquakes have occurred numerous times in Southern California, the City of Pomona has never declared a state of emergency due to an earthquake. During the 1987 Whittier Narrows earthquake, several historic buildings were damaged, but the city did not sustain any deaths or serious injuries. Relatively speaking, Pomona has been able to avoid many of the dire effects of earthquakes experienced by other Southern California communities. However, the risk to the city from an earthquake is still great given the history of earthquakes in the Southern California and the probability of future occurrence in the region. In order to examine the earthquake threat to Pomona, it is useful to review experiences of other Southern California cities in profiling earthquake hazards.

Historical earthquake records can generally be divided into records of the pre-instrumental period and the instrumental period. In the absence of the instrumentation the detection of earthquakes is based on the observations and witness reports and is dependent upon population density and distribution. Since California was sparsely populated in the 1800's the detection of pre-instrumental earthquakes is relatively difficult. However, two very large earthquakes, the

[17] *USGS Earthquake Hazards Program website: http: //earthquake.usgs.gov/faq/plates.html, accessed June 30, 2004*

Fort Tejon in 1857 (7.9) and the Owens Valley in 1872 (7.6) are evidence of the tremendously damaging potential of earthquakes in Southern California. In more recent times, four earthquakes greater than 7.0 have occurred in Southern California: 7.5 in Kern County (1952) 7.3 in Landers (1992), 7.1 in Hector Mine (1999), and 7.1 in Ridgecrest (2019). **Table 4-1** lists historic earthquakes in Southern California of a magnitude 5.0 or greater.

Table 4-1: Southern California Earthquakes with Magnitude 5.0 or Greater

Southern California Region Earthquakes with a Magnitude 5.0 or Greater			
1769	Los Angeles Basin – M6.0	1941	Carpinteria – M5.5
1800	San Diego Region – M6.3	1952	Kern County – M7.5
1812	Wrightwood – M7.5	1954	W. of Wheeler Ridge – M6.4
1812	Santa Barbara Channel – M7.2	1971	San Fernando – M6.6
1827	Los Angeles Region – M5.5	1973	Point Mugu – M5.3
1855	Los Angeles Region – M6.0	1986	North Palm Springs – M5.6
1857	Fort Tejon – M7.9	1987	Whittier Narrows – M5.9
1858	San Bernardino Region – M6.0	1992	Landers – M7.3
1862	San Diego Region – M5.9	1992	Big Bear – M6.5
1892	San Jacinto or Elsinore Fault – M6.3	1994	Northridge – M6.7
1893	Pico Canyon – M5.7	1999	Hector Mine – M7.1
1894	Lytle Creek Region – M6.0	2008	Chino Hills – M5.4
1894	E. of San Diego – M5.7	2014	La Habra – M5.1
1899	Lytle Creek Region – M5.7	2014	South Napa – M6.0
1899	San Jacinto and Hemet – M6.6	2016	Borrego Springs – M5.2
1907	San Bernardino Region – M5.3	2019	Ridgecrest (1 of 2) – M6.4
1910	Glen Ivy Hot Springs – M5.5	2019	Ridgecrest (2 of 2) – M7.1
1916	Tejon Pass Region – M6.1	2019-2020	Ridgecrest aftershocks; At least six occurrences greater than M5.0, less than M6.0
1918	San Jacinto – M6.8	2020	Lone Pine – M5.8
1923	San Bernardino Region – M6.3	2021	Calipatria/Brawley – M5.3
1925	Santa Barbara – M6.8	2021	Little Antelope Valley – M6.0
1933	Long Beach – M6.4		

Sources: Southern California Earthquake Data Center (SCEDC) Website, accessed November 2021.
Southern California Seismic Network Website, accessed November 2021

The damage from these four large earthquakes was limited because they occurred in areas that were sparsely populated. The seismic risk is much more severe today in areas of widespread growth throughout Southern California, with the population at risk in the millions, rather than a few hundred or a few thousand persons. This is evidenced by the Northridge earthquake of 1994.

Although the magnitude of the earthquake (6.7) was smaller than the aforementioned events, the Northridge earthquake became the costliest earthquake in California history. 57 people were killed, and more than 1,500 people were seriously injured.

For days afterward, thousands of homes and businesses were without electricity, tens of thousands had no gas, and nearly 50,000 had little or no water. Approximately 15,000 structures were moderately to severely damaged, which left thousands of people temporarily homeless. The total cost of the damage caused by the Northridge earthquake approached 50 billion dollars.

4.2.2 HAZARD LOCATION AND EXTENT

There are numerous faults in the Los Angeles area that are categorized as active, potentially active, and inactive. A fault is classified as active if it has either moved during the Holocene time (during the last 11,000 years) or is included in an Alquist Priolo Earthquake Fault zone (as established by the California Division of Mines and Geology). A fault is classified as potentially active if it has experienced movement within Quaternary time (during the last 1.8 million years). Faults that have not moved in the last 1.8 million years are generally considered inactive. Surface displacement can be recognized by the existence of cliffs in alluvium, terraces, offset stream courses, fault troughs and saddles, the alignment of depressions, sag ponds, and the existence of steep mountain fronts.

REGIONAL FAULTS

Earthquakes from several active and potentially active faults in the Southern California region could affect future development within the City of Pomona, although no known regional faults directly traverse the city. It should be noted, however, that the Northridge Earthquake occurred on a previously undetected active fault, and more faults may exist than are discussed here. The nearest identified regional faults are summarized below and presented in **Map 4-1**.

Active Faults

- *San Andreas Fault Zone.* Located approximately 20 miles to the northeast of the City, this fault zone extends from the Gulf of California northward to the Cape Mendocino area where it continues northward along the ocean floor. The length of the fault and its active seismic history indicates that it has a very high potential for large scale movement in the near future (magnitude 8.0+ on Richter scale) and should be considered important in land use planning for most cities in California.

Map 4-1: Seismic Hazards

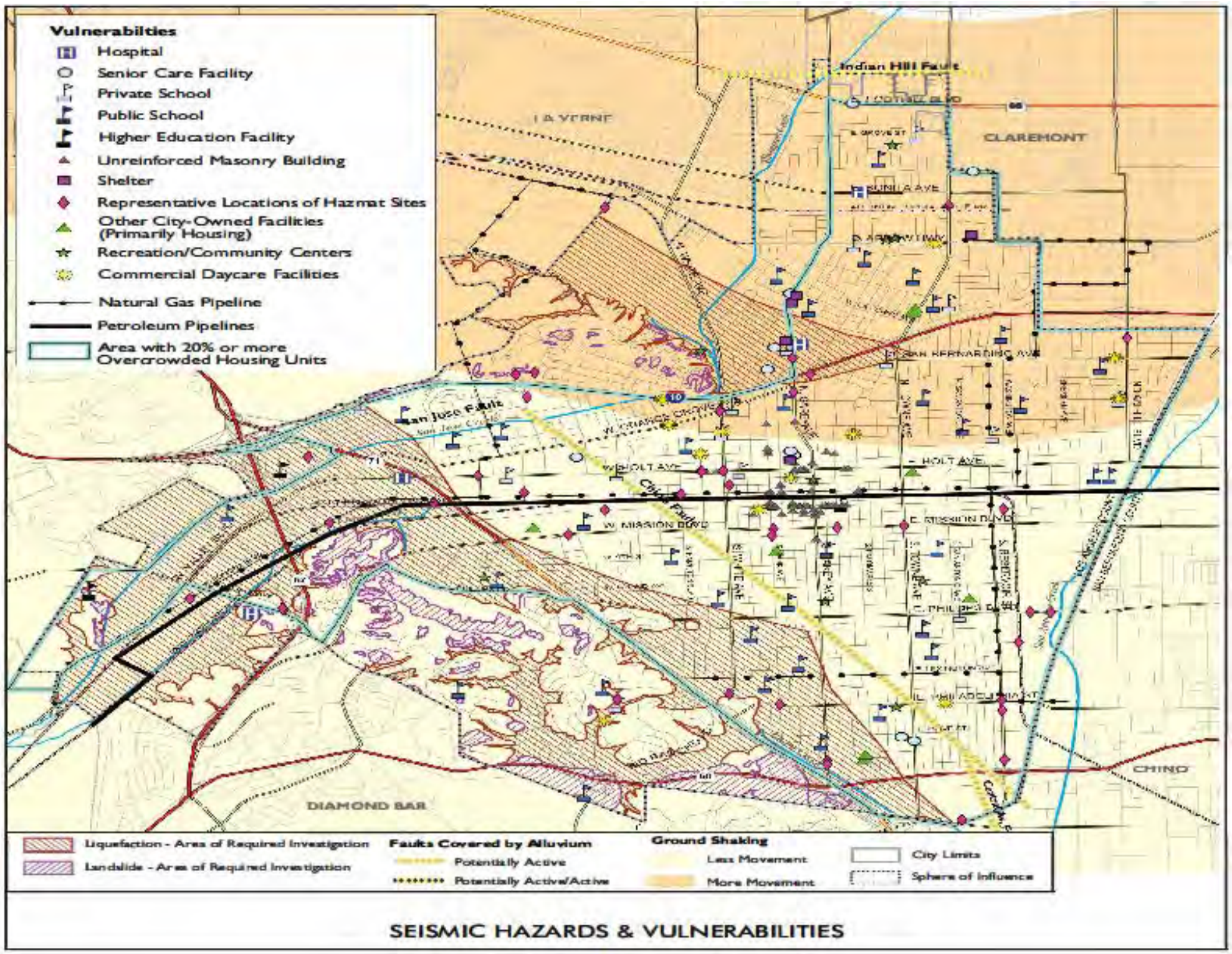
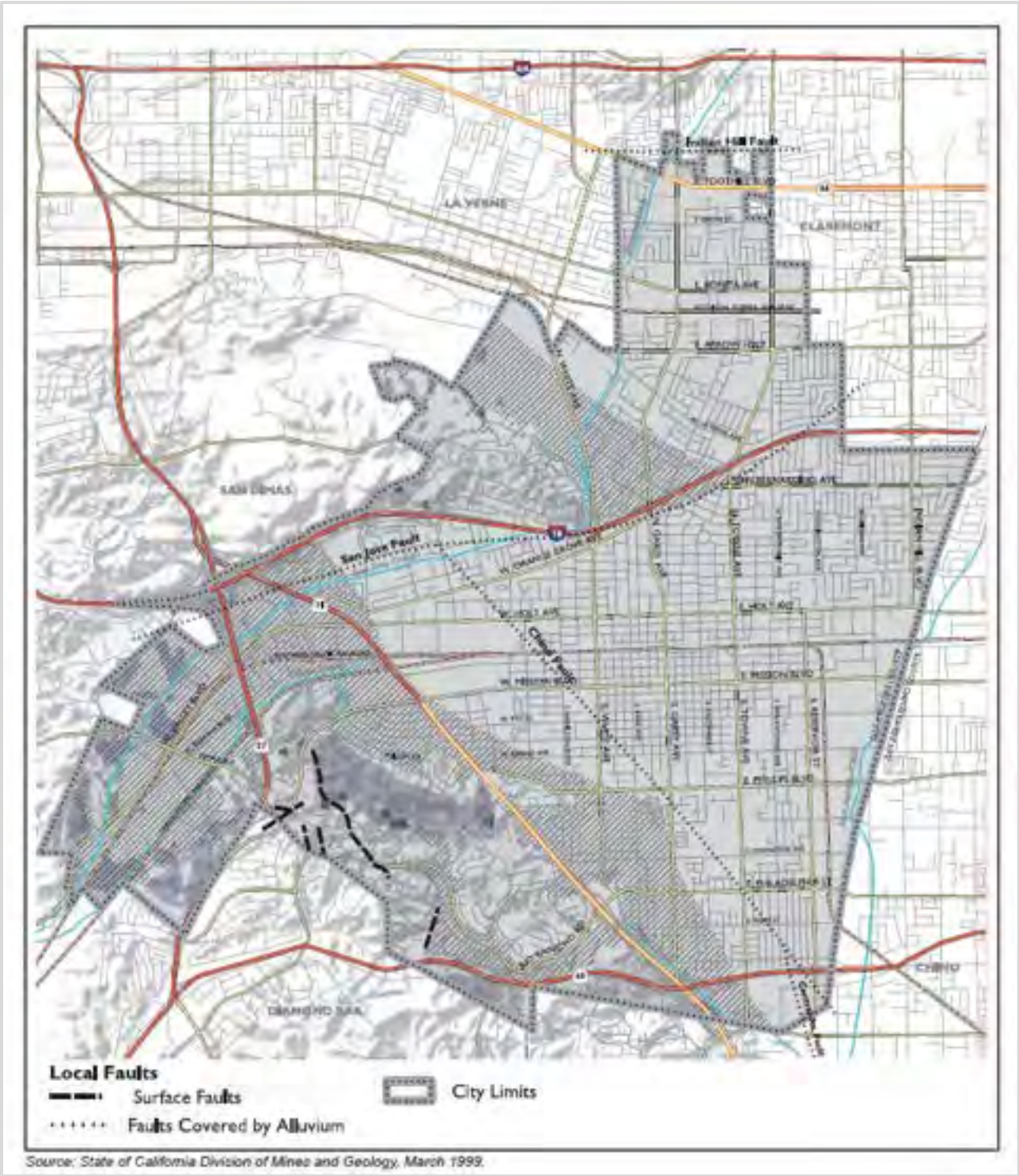


Figure 4-2: Regional Faults



- *Sierra Madre Fault System.* Located approximately one mile north of the City, at the base of the San Gabriel Mountains, this fault system forms a prominent 50-mile long east-west

structural zone on the south side of the San Gabriel Mountains. It consists of a complex system of dips and slips and has a left lateral reverse component. The Sierra Madre fault system has been responsible for uplift of the San Gabriel Mountains by faulting in response to tectonic compression. In many places, the faults have placed basement bedrock over alluvium where they dip northerly below the steep topographic front of the San Gabriel Mountains.

- *Whittier-Elsinore Fault Zone.* This fault zone is located along the southern base of the Puente Hills, approximately 9 miles to the southwest of the City. This northwest-trending fault trends from Whittier Narrows southeast across the Santa Ana River, past Lake Elsinore into western Imperial County and then into Mexico. This fault zone has the expected maximum capability of a magnitude 6.6 earthquake.

- *San Fernando Fault Zone.* This fault is located approximately 30 miles northwest of the City. Generally, fault segments are east-west trending thrust faults with associated left lateral movement.

- *Newport-Inglewood Fault Zone.* Located approximately 35 miles southwest of the City this fault zone could generate a 7.0 magnitude earthquake within the next 50 to 100 years.

- *Norwalk Fault.* Located approximately 25-miles southwest of the City, this fault strikes 65 to 85 degrees to the northwest and dips steeply to the northeast. The fault is approximately 16 miles long and has an accurate trace between Buena Park and Tustin. Micro seismic activity along the Norwalk Fault is high and it may be capable of generating a magnitude 6.3 earthquake.

Potentially Active Faults

- *San Gabriel Fault.* Labeled as potentially active, this fault is located approximately 20 miles northwest of the City. This fault extends from Frazier Park to Mount Baldy Village, a distance of approximately 84 miles. Because of its length and its ancestral relationship with the San Andreas Fault System, its potential future activity must be realized. Due to the length of its surface trace, the San Gabriel Fault is believed capable of generating a magnitude 7.8 earthquake.

- *Verdugo Fault.* Located approximately 22 miles west of the City, this potentially active fault bounds the south flank of the Verdugo Mountains and appears to merge with the Eagle Rock-San Rafael Fault System in the vicinity of the Verdugo Wash. Low magnitude earthquakes (less than 3.0) which have been attributed to activity along the Verdugo Fault are occasionally recorded in the Burbank-Glendale area. No direct evidence of ground displacement has been observed as associated with these low magnitude earthquakes.

The Verdugo Fault has a high potential for future activity and is capable of generating a magnitude 6.4 earthquake.

- *Santa Monica Fault.* This fault is located approximately 25 miles west of the City. No detailed information is available on the exact location of this southwest-northeast trending fault at the ground surface (fault trace), or on its geometric orientation. This fault the Malibu Coast Fault, and the Raymond Fault belong to one large fault system. Classified as a potentially active fault, this fault could generate a moderate seismic event (magnitude 6.6).

Local Faults

In addition to the regional faults, there are several local faults located within the city that are considered potentially active. No recent seismic activity has been recorded along these faults in the last 10,000 years. However, a major earthquake occurring along with any of these faults would be capable of generating seismic hazards and strong ground shaking effects within the City. These local faults include the San Jose, Indian Hill, Chino, and Central Avenue Faults. Of the local faults, the probability of earthquake activity is considered the highest along the San Jose Fault, with possible ground rupture. Neither the Indian Hills Fault, Chino Fault, nor the Central Avenue Fault have high probability of seismic activity, and their precise locations are currently not well defined. None of the local faults have been placed in an Alquist-Priolo Special Studies Zone. Thus, no fault rupture hazard is anticipated along the fault traces that pass through the City. These local faults are further described below and are illustrated in **Figure 4-2.**

- *San Jose Fault.* This fault is classified as potentially active and is located in the San Jose Hills, on the western edge of the City. The fault is approximately 13 kilometers long and runs in a northeast/southwest direction approximately parallel to the I-10 freeway. The fault has an 80-to-85-degree upward dip and has a revere movement with the north side up. The fault displaces upper Miocene sedimentary and volcanic rocks as much as 2,700 feet vertically, with a 100 - meter vertical offset in older subsurface alluvium. Some geologists consider this fault as seismically active and the origin of the L.A. County earthquakes in 1988 and 1990.

- *Indian Hill Fault.* This fault is located along the northern section of the city and runs an east/west direction for approximately 9 kilometers. It is believed to be a single strand and is considered potentially active. This fault serves as a barrier to groundwater movement and offsets soils of Late Pleistocene age which is the reason it is considered potentially active.

- *Chino Fault.* Considered to be a part of the Whittier-Elsinore fault system, this fault borders the Puente Hills to the northeast and is buried along most of its length. It is

approximately 28 kilometers long from the Santa Ana Mountains to the City of Pomona in a northwest-southeast direction, as it joins the San Jose Fault, near the I-10. Based on geomorphic evidence, it does not appear to have as great a potential for seismic activity. The fault has an estimated slip rate of 0.2 mm/year. Some geologists have questioned whether the Chino fault is in reality an earthquake fault, since recent evidence indicates that it is not a fault but the contact point between bedrock and less consolidated alluvium, although in 2008 the Chino Fault had a quake that damaged Pomona City Hall and a number of URM buildings in the downtown area.

- *Central Avenue Fault*. Considered a potentially active fault and located in the City of Chino, this fault extends into the southern portion of the City of Pomona. This fault is approximately 8 kilometers long and believed to be a single strand that is subparallel to the Chino fault. The fault exhibits displacement on Quaternary and Holocene age deposits but has no surface expression.

EARTHQUAKE EXTENT

Magnitude

A seismograph can determine the size or magnitude (Richter Magnitude Scale) of an earthquake by measuring the movement of the Earth's surface and recording the radiating earthquake waves. Each whole number magnitude increase represents a ten-fold increase in the up and down motion recorded by the seismograph. An M = 6 earthquake causes 10 times the recorded motion of an M = 5 and 100 times the motion of an M = 4 earthquake. The magnitude is then used to calculate the amount of energy released by the earthquake. Each whole number increase in magnitude corresponds to an energy increase of about 32 times the lower magnitude value. An M = 6 earthquake releases about 30 times the energy of a M = 5 and nearly 1,000 times the energy of a M = 4 earthquake.

As earthquakes increase in size, the ground motion no longer increases in a way directly related to the increased size of the earthquake. A different method of determining magnitude based on the number of factors, such as area of slip, is used to calculate the size of earthquakes generally greater than M = 8.

Intensity

Earthquake size may also be determined using a subjective scale of observed damage. This method was used before the installation of seismographs and before the development of the Richter Magnitude Scale. An example is the Modified Mercalli Intensity (MMI) Scale first published in 1931. The intensity of damage observed at a specific building depends upon a number of factors, such as the earthquake's magnitude, distance from the fault generating the earthquake, type of geologic materials underneath the building, type of building construction, age of construction, and other attributes. Over time the MMI scale has been modified to address

changes in building types. All these possible variations in damage result in a single earthquake being capable of producing intensities ranging from *not felt at a particular location* (MMI = I) to *causing catastrophic damage* (MMI = XII) at another place. Historical records generally list an earthquake's maximum observed intensity and the size of the area in which the earthquake was felt.

Table 4-2: Modified Mercalli vs. Richter Scale

Modified Mercalli vs. Richter Scale		
Category	**Modified Mercalli Description**	**Richter Scale**
I. Instrumental	Not felt	**2.5 – Generally not felt but recorded by seismograph**
II. Weak	Felt only a few people, especially on upper floors of tall buildings	
III. Slight	Felt by people lying down, seated on a land surface, or in the upper stories of tall buildings	**3.5 – Felt by many people**
IV. Moderate	Felt indoors by many, by few outside; dishes and windows rattle	
V. Rather Strong	Generally felt by everyone; sleeping people may be awakened; vibrations like train passing close to house	
VI. Strong	Trees and poles may sway, some damage from falling objects	**4.5 – Some local damage may occur**
VII. Very Strong	General alarm; walls and plaster crack; difficult to stand; noticed by people driving	
VIII. Destructive	Damage slight in specially designed structures; considerable in ordinary buildings with partial collapse; damage great in poorly built structures; damage to chimneys, factory stacks, columns, monuments, walls	**6.0 – Destructive earthquake**
IX. Violent	General panic; some houses collapse, pipes break; damage considerable in poorly designed structures; buildings shifted off of foundation	
X. Intense	Some well-built wooden structures destroyed,; most masonry and frame structures destroyed with foundation; obvious ground cracks; railroad tracks bent; some landslides on steep hillsides	**7.0 – Major earthquake**
XI. Extreme	Few buildings survive; bridges damaged or destroyed; all services interrupted (electrical, water, sewage, railroad, etc.); severe landslides	**8.0 and up – Great earthquakes**
XII. Catastrophic	Total destruction; objects thrown into the air; ground moves in waves or ripples; river courses and topography altered	

EARTHQUAKE HAZARDS

Several hazards can be produced by a single earthquake event. Ground shaking, landslides, and liquefaction are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake. A discussion of these hazards is presented below, and areas affected by each of these hazards are mapped in **Figure 4-2.**

Ground Shaking

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter.

Although the entire city is susceptible to damage from ground shaking, geological conditions can greatly influence the amount of shaking experienced throughout the City. The majority of Pomona is underlain by alluvial soils, transported from the San Gabriel Mountains the north, which are less resistant to shaking than other soil types. However, portions of the city situated on bedrock such as San Jose (Ganesha Hills) and Puente (Elephant Hill, Phillips Ranch) would likely experience less ground shaking and associated damage.

Landslides

Landslides are secondary earthquake hazards that can occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake.

The Northridge earthquake of 1994 provides an example of the serious and damaging effects of landslides. As a result of the magnitude 6.7 earthquake, more than 11,000 landslides occurred over an area of almost 400 square miles. The landslides destroyed dozens of homes, blocked roads, and damaged oil-field infrastructure. They indirectly caused deaths from Coccidioidomycosis (valley fever), the spore of which was released from the soil during landslide activity and blown towards populated coastal areas.[18]

Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes. In Pomona, the risk of damage due to landslides is confined to parts of Phillips Ranch and Ganesha Hills. These areas are delineated by the State of California Division of Mines and Geology and depicted in **Figure 4-2.** Although some of the susceptible areas have residential development, most of them are located in designated open space.

[18] *Highland. L.M. and R.L. Schuster, Significant Landslide Events in the United States. Accessed via website at: http://landslides.usgs.gov.html_tiles/pubs/report/Landslides_pass_508.pdf*

In the landslide-prone areas that are developed, the risk of a damaging flow is even greater. Although landslides are a natural geologic process in the hills around Pomona, residential developments in these areas exacerbate the risk of landslide hazards. Grading for road construction and development can increase slope steepness and contribute to the speed and severity of landslides. Grading and construction can also decrease the stability of a hill slope by adding weight to the top, removing support at the base of the slope, and increasing water content. Other human activities affecting landslides include excavation, drainage and groundwater alterations, and changes in vegetation.[19]

Liquefaction

The phenomenon of liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these structures. Pomona is one of many communities in Southern California that is built on an ancient river bottom and has sandy soil. In some cases, this ground may be subject to liquefaction, depending on the depth of the water table.

The California Geological Survey identifies and maps areas susceptible to liquefaction, based on groundwater levels and geologic materials. Pomona has 4,025 acres or 27 percent of the city area that fall within these zones and are susceptible to liquefaction. These areas generally occur at the base of the hills in the southern and western portions of the City. Liquefaction areas are presented in **Map 4-1.**

4.2.3 PROBABILITY OF FUTURE OCCURRENCE

The USGS estimates that within the next 30 years the probability is 99% that an earthquake measuring a magnitude of 6.7 or greater will occur in California[20]. It is impossible to predict exactly where it will take place; however, there are fault segments that are considered more likely than others to produce such an earthquake. Along the Earth's plate boundaries, segments exist where no large earthquakes have occurred for long intervals of time. Scientists term these segments "seismic gaps" and, in general, have been successful in forecasting the time when some of the seismic gaps will produce large earthquakes.

Geologic studies show that over the past 1,400 to 1,500 years large earthquakes have occurred at about 150-year intervals on the southern San Andreas fault. As the last large earthquake on the southern San Andreas occurred in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades. However, the San Andreas fault is just one of

[19] *Planning For Natural Hazards: The Oregon Technical Resource Guide. Department of Land Conservation and Development. 2000: Chapter 5.*

[20] *https://www.usgs.gov/congressional-statement/statement-dr-david-applegate-senior-advisor-earthquake-and-geologic-hazards. September 15, 2021*

many faults capable of producing large earthquakes in the region.

Although the science of earthquakes is not exact, these predictions are persuasive reminders of the constant risk of earthquakes to Southern California communities. The focus of the research on estimating the timeframe and location of earthquakes is itself a reminder that when discussing earthquakes, it is not a matter of "if" one will occur, it is a matter of when and where.

4.3 VULNERABILITY ASSESSMENT

OVERVIEW

The effects of earthquakes span a large area, and large earthquakes occurring in many parts of the Southern California region would probably be felt throughout the region. However, the degree to which earthquakes are felt, and the damage associated with them may vary. At risk from earthquake damage are large stocks of old buildings and bridges; many high tech and hazardous materials facilities; extensive sewer, water, and natural gas pipelines; earth dams; petroleum pipelines; and other critical facilities and private property located in the City. Identifying these vulnerabilities and estimating potential losses that could occur due to an earthquake event are crucial steps in the process of formulating effective, efficient mitigation measures.

4.3.1 IDENTIFYING VULNERABILITIES

Chapter 3: Risk Assessment details the various types of critical and vulnerable facilities within Pomona. Each of these types of facilities is vulnerable to damage by an earthquake and its associated hazards of ground shaking, landslides, and liquefaction. Of these facilities, the Technical Advisory Committee, drawing upon available scientific research, building structural information, historical experience, and community knowledge, identified specific vulnerabilities to target in the earthquake hazard mitigation process. The following sections identify those facilities that are considered the most vulnerable portions of the city to earthquake damage and are specific targets of earthquake mitigation action items.

EMERGENCY SERVICES

As previously discussed in **Chapter 3: Risk Assessment**, much of Pomona was built before seismic safety standards were implemented in 1976. Many of the City's critical facilities were also built before 1976 and could be more vulnerable to the hazards associated with earthquakes. Detailed studies will have to be conducted in order to determine which, if any, of the City's buildings have the potential to suffer serious damage during an earthquake. However, identifying those that predate seismic safety standards will help to prioritize the inventory process.

- Emergency Government Operations. All the buildings that are designated as facilities for use during an emergency were likely built before 1976. The only location identified in the City's EOP that is not inside a potentially vulnerable structure is located in the west parking lot of City Hall. However, this location lacks many of the amenities of an operational building, such as shelter, electricity, restrooms, and additional assets that would be significant in the operation of the Emergency Operation Center (EOC).

- Police and Fire Facilities. The majority of police and fire facilities in Pomona were built before 1976. These building include the main building, jail, and property/evidence storage structures of the Pomona Police Department and five of the City's eight fire stations (an additional fire station was built in 1952, however it has been retrofitted to conform to 2003 building code standards). These five stations have not been seismically retrofitted, although they were evaluated in 2003 for seismic safety and each rated “better than average" for seismic performance relative to buildings of the same general type (see **Table 4-3**).

Table 4-3: Fire Stations Built Before 1976

FIRE STATION	YEAR BUILT	CONSTRUCTION MATERIALS	RETROFIT?
181	Unknown Pre-1976	Reinforced Concrete Reinforced Masonry	No
182	1963	Reinforced Masonry	No
183	1952	Reinforced Masonry	Yes (2003)
184	Unknown: (1959-1974)	Tilt-Up precast concrete	No
185	1962	Reinforced Masonry	No
186	1963	Reinforced Masonry	No

181 was closed in 2012, but the Division VIII Office, Battalion Chiefs, Fire Department Offices, and other department sections remained. In January 2020, the Division VIII Office and Fire Prevention Office were relocated from Pomona to Diamond Bar

HOSPITALS

Both of the major medical facilities in Pomona house vulnerable patient populations who would require substantial assistance in the event of damage. Additionally, damage that incapacitated Pomona Valley Hospital Medical Center, which is the only provider of emergency medical services in the City, would detrimentally affect Pomona's ability to care for people injured in a large earthquake.

In accordance with the Hospital Seismic Safety Act - which requires that all hospitals be in compliance with seismic standards to allow the hospital to be capable of reasonably providing continued operations following a major seismic event by January 1, 2030 - a number of structures

at these facilities are being retrofitted or replaced. Further details on each of the facilities is provided below:

- *Pomona Valley Hospital Medical Center*. The hospital celebrated its 100-year anniversary in 2003. The buildings that make up the Pomona Valley Community Hospital Medical Center (PVHMC) were constructed over several decades. The hospital building has likewise been constructed in stages, beginning with the original 1913 structure (currently Wing A of the hospital building).

  A Specific Plan to address seismic safety issues and an expansion of the hospital facilities for the PVHMC was adopted in 2008 and most recently amended in 2016. The plan is intended to guide the future growth and operation of PVHMC and to meet Senate Bill 1953 (SB 1953) hospital seismic safety requirements. Under the Specific Plan, PVHMC would be expanded in three phases. Phase 1 would include the construction of a new 56,000 sf outpatient pavilion and a 138,000-sf inpatient wing and lobby addition to the main hospital building. Phase 2 would add a 54,000-outpatient pavilion and a 123,000-sf hospital inpatient wing. Phase 3 would add an additional 129,000 sf of inpatient facilities in a new wing and add a 400-stall parking structure. The PVHMC core campus will have expanded to include 1,012,314-sf of combined new and existing facilities, a net increase of 267,299-sf. Demolition of 232,701-sf of existing facilities is also proposed, the majority of which would occur at the end of Phase 3. Implementation of the Specific Plan would occur over a period of years, extending until 2030[21].

  In communication with hospital staff, it was conveyed that, as of May 2021, the Woman's Center and Diagnostics and Testing buildings are structurally compliant, and that several buildings were in plan check with OSHPD for material sampling, a precursor to plan check submittals for structural upgrades.

[21] https://ceqanet.opr.ca.gov/2008031111/6. *Accessed September 15, 2021*

Figure 4-3: PVHMC Specific Plan



- *Casa Colina Center for Rehabilitative Medicine*. Casa Colina completed construction of a new hospital facility which started receiving patients in 2005. This facility was built in full compliance with the safety standards of SB 1953. All outpatient facilities were built from 2001 to the present.

Although these private facilities are privately owned and will be responsible for mitigating hazards on their property, increased preparedness and communication between them and City officials will help to coordinate emergency efforts in the event of an earthquake.

UTILITIES

Each of the components of Pomona's utility systems contribute to its overall operation and efficiency. However, some components are more critical to system operation and have been targeted as specific vulnerabilities to be addressed during earthquake mitigation.

Water

Maintaining water quality and distribution are crucially important during and after hazard events. The following critical components of the City's water service system are vulnerable to earthquake damage:

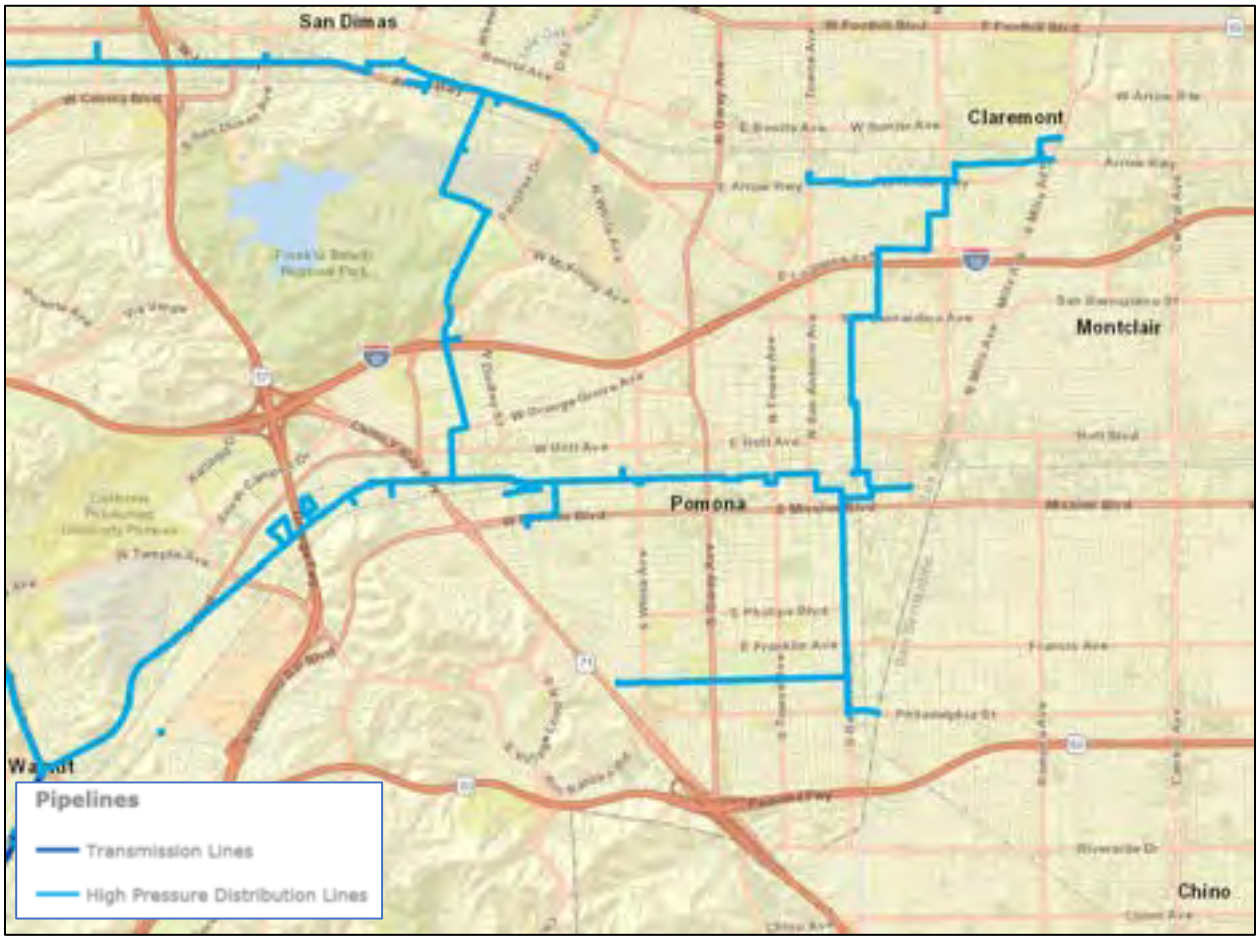
- *Water Reservoirs*. Six of the City's 22 water reservoirs have been upgraded with seismic safety valves which would shut off the reservoir in the event of a rupture, preventing drainage of the reservoir and potential flooding. Currently, there are no plans to upgrade the remaining 16.
- *Groundwater Wells.* A majority of Pomona's water supply is provided by local groundwater wells. The structural stability of these facilities is unknown and would have to be evaluated through further technical studies to assess vulnerability to ground shaking and liquefaction. None of the ground water wells are located in areas subject to earthquake-induced landslides. If a well(s) were to experience earthquake-related damage, local water supplies would only be incrementally affected, and the overall community impact is considered low.
- *Water Treatment.* The City's Anion Exchange Plant removes nitrates from the water supply for a significant portion of the City.[22] Failure of this plant has the potential to substantially limit potable water supply. The structural stability of the plant is unknown; however, it was completed in 1992, and is assumed to have a high level of resistance to ground shaking due to its modern construction standards.

Underground Utility Lines

Underground utilities - such as natural gas and petroleum - may be subject to rupture during an earthquake, creating the potential for fire or the release of hazardous chemicals. Specifically, the two petroleum pipelines and seven primary natural gas distribution pipelines could pose significant fire and hazardous materials risks if ruptured. In addition to these main lines, the aging underground utility network in Pomona may experience any number of ruptures along its lines, resulting in localized service disruptions or release of materials.

[22] *https://www.envirogen.com/wp-content/uploads/2019/07/Pomona-Case_Study-ETI-1.pdf, accessed November 6, 2021.*

Figure 4-4: Gas Transmission Lines in Los Angeles County



SCHOOLS

In increasing Pomona's resilience to earthquakes, prioritizing the safety of the community's children is a primary concern. The many schools within the City house thousands of students during school hours and are considered a substantial vulnerability. Many of Pomona's children attend school at private facilities, but the vast majority attend school at one of Pomona Unified School District's (PUSD) facilities.

RECREATION AND COMMUNITY CENTERS

In addition to schools, recreation and community centers also house a large number of children. As discussed in **Chapter 3: Risk Assessment**, the City of Pomona operates six community centers. Three of these facilities were constructed before seismic safety codes were established. Currently, no other information about the potential structural vulnerability to earthquake damage is available, and further studies would need to be conducted to determine their level of vulnerability. Two of the community centers are also in areas subject to liquefaction. The Ganesha Park Community Center, one of the City's most popular recreation facilities, is also the

most potentially vulnerable. It was constructed in 1950 and located in an area subject to strong ground shaking, liquefaction, and earthquake induced landslides.

UNREINFORCED MASONRY BUILDINGS

The City of Pomona has dozens of unreinforced masonry (URM) buildings. These buildings are especially vulnerable to damage and collapse during earthquakes. Their potential for collapse poses hazards to life and property loss. Also, many of these buildings are valuable assets to the City's rich historical heritage. The URM buildings in Pomona are clustered in the oldest and most central portion of the city, largely located along 2nd Street in Downtown.

VULNERABLE DEVELOPMENT PATTERNS

In general, the size of Pomona households is large. 26% of Pomona households are considered “large” which is defined as five or more individuals per household. The average household size is 2019 was 3.77, which is almost one person per household more than the Los Angeles County average. Many of these households are also considered “overcrowded”, which is defined as more than one person living per room within a house. 31.3% of households are considered overcrowded, compared to 21.8% in Los Angeles County.

Central Pomona has a number of vulnerable development characteristics that could potentially result in more damage due to an earthquake when compared to other areas of the City. In general, census tracts with the highest percentages of overcrowded units are located in central Pomona; these high densities increase the potential number of people per neighborhood who would be impacted by an earthquake. Additionally, many of these overcrowded areas are located in neighborhoods with older structures, which pre-date seismic safety standards. Finally, large numbers of multi-family units are located in Central Pomona, of which a number are likely “soft story” apartment buildings. This type of construction is characterized by multi-storied structures that have an opening on the ground floor, such as a garage, that is less sturdy than the floors above it. These buildings are particularly vulnerable to earthquake damage, as the weakened first story may sustain damage, shift, or collapse. The combination of these development characteristics creates an area of the city with elevated susceptibility to the hazardous effects of earthquakes.

RAILROADS

The Union Pacific Railroad (UPR) line that is located in the center of the city is a primary east-west freight corridor. Trains on the tracks also carry passengers on a much more limited basis. An earthquake that caused derailment, damage to the tracks by liquefaction, or obstruction on the tracks due to landslides would be a tremendous vulnerability to the city. A train present on the tracks would seriously hamper the ability of emergency vehicles to traverse the city, especially if the crucial underpasses at Garey, White, and Towne Avenues were blocked. Although the possibility of a train derailment in the city seems remote, it was just such an event that

prompted the construction of Pomona Valley Hospital Medical Center, as mentioned in **Chapter 1 Introduction**. The City does not have jurisdiction over the UPR tracks; hazard planning and mitigation is the responsibility of the Union Pacific Railroad. However, the City can coordinate with UPR on mitigation planning and work to maximize local emergency facility resiliency to help reduce risks associated with the railroad.

4.3.2 ESTIMATING POTENTIAL LOSSES

Risk analysis involves estimating the damage and costs likely to be experienced in a geographic area over a period of time[23]. Factors included in assessing earthquake risk include population and property distribution in the hazard area, the frequency of earthquake events, landslide susceptibility, buildings, infrastructure, and disaster preparedness of the region. This type of analysis can generate estimates of the damage to the region due to an earthquake event in a specific location. FEMA's software program, HAZUS, uses mathematical formulas and information about building stock, local geology and the location and size of potential earthquakes, economic data, and other information to estimate losses from a potential earthquake[24].

HAZUS EARTHQUAKE SCENARIO

To perform the risk analysis for this LHMP, a magnitude 6.7 earthquake was simulated using HAZUS. The earthquake scenario was based on ground shaking data derived from USGS shake map scenario on the San Jose Fault. It is impossible to exactly predict the circumstances of the next earthquake to affect the city, and the data provided by the HAZUS simulation will surely differ from the actual losses experienced due to such an event. However, the use of HAZUS allows the City to view reasonable potential losses from a modeled earthquake and make appropriate mitigation and emergency preparedness decisions.

It is noteworthy that this model assumes that the entire city is underlain by alluvial site conditions; although the majority of the city is located on an alluvial fan, portions on the western boundaries are underlain by bed rock, which is more resistant to ground shaking. Additionally, the secondary earthquake hazards of fire and debris generation were simulated in this scenario. A discussion of the risks associated with these hazards follows the summary of HAZUS results.

Structural Damage

In this HAZUS scenario, 12.5 percent of buildings in Pomona experienced at least moderate damage. Approximately 900 structures were completely destroyed, and the vast majority of these were residential uses. Overall, buildings that sustained the most damage were manufactured housing or structures with wood construction.

[23] *Burby. R. (Ed.) Cooperating with Nature: Confronting Natural Hazard s with Land Use Planning for Sustainable Communities (1998). Washington D.C. Joseph Henry Press.*
[24] *FEMA HAZUS http://www.fema.gov/hazus (May 2021).*

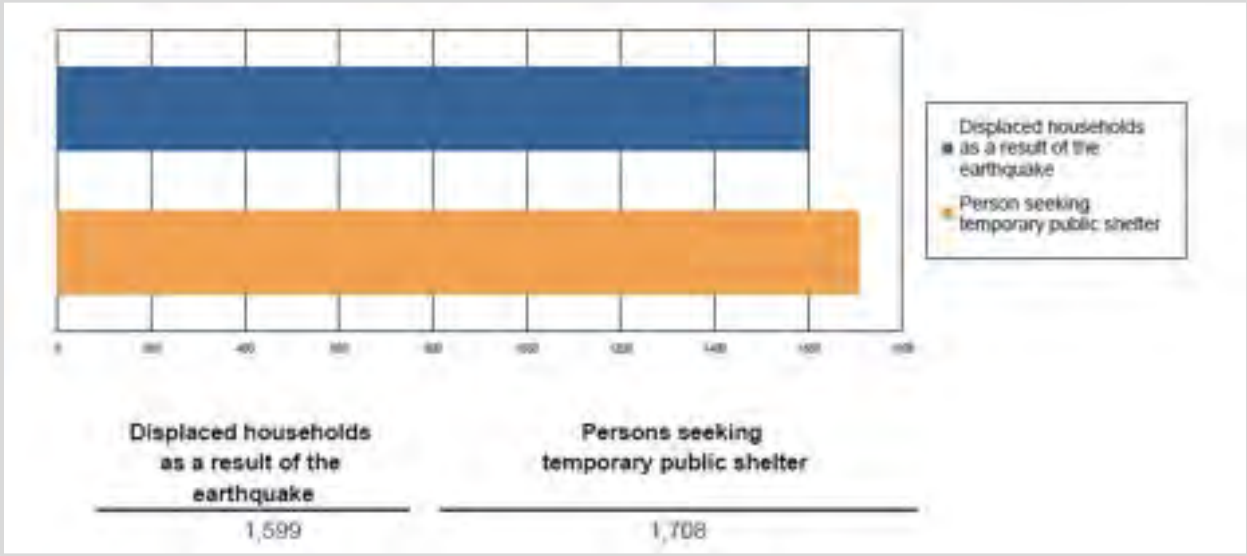
Table 4-4: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	7.29	0.08	10.73	0.08	11.07	0.14	0.10	0.29	3.01	0.33
Commercial	238.98	2.77	360.95	2.73	566.60	6.67	365.56	17.39	162.91	18.10
Education	18.99	0.22	24.78	0.19	27.19	0.32	13.38	0.64	4.66	0.52
Government	2.37	0.03	3.52	0.03	5.50	0.06	3.86	0.18	1.75	0.19
Industrial	60.74	0.71	93.99	0.71	164.91	1.94	113.17	5.38	54.19	6.02
Other Residential	452.06	5.25	768.73	5.81	925.52	10.90	798.66	38.00	447.04	49.68
Religion	24.94	0.29	35.75	0.27	44.41	0.52	27.58	1.31	12.32	1.37
Single Family	7807.31	90.65	11926.17	90.18	6745.15	79.44	773.37	36.80	213.99	23.78
Total	8,613		13,225		8,491		2,102		900	

Displaced Persons

This model estimated that the earthquake displaced 1,599 households. Although some of these people would be able to seek shelter with relatives, friends, or alternative means, approximately 1,708 people would require accommodation in temporary public shelters.

Table 4-5: Displaced Households/Persons Seeking Short Term Public Shelter



Casualties

Casualty estimates are provided for three times of day, 2:00 AM, 2:00 PM, and 5:00 PM. Casualties are highest during the 2:00 PM scenario with approximately 1,550 people were injured or killed during this earthquake scenario. The majority of these casualties, roughly 1,110, were due to minor injuries requiring medical attention but not hospitalization. The remaining number includes more serious injuries requiring hospitalization and approximately 90 deaths.

Table 4-6: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	10.80	3.03	0.49	0.96
	Commuting	0.03	0.07	0.06	0.02
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	20.04	5.48	0.83	1.64
	Other-Residential	221.85	53.32	6.12	11.60
	Single Family	165.69	24.49	1.21	2.10
	Total	**418**	**86**	**9**	**16**
2 PM	Commercial	640.02	179.18	28.92	56.83
	Commuting	0.30	0.59	0.76	0.16
	Educational	239.88	65.88	10.65	20.83
	Hotels	0.00	0.00	0.00	0.00
	Industrial	147.67	40.29	6.16	11.99
	Other-Residential	48.69	11.75	1.39	2.56
	Single Family	35.87	5.36	0.31	0.46
	Total	**1,112**	**303**	**48**	**93**
5 PM	Commercial	458.61	126.01	20.72	40.22
	Commuting	4.67	9.41	12.03	2.52
	Educational	23.33	6.44	1.05	2.05
	Hotels	0.00	0.00	0.00	0.00
	Industrial	92.29	25.18	3.85	7.49
	Other-Residential	83.22	20.07	2.37	4.38
	Single Family	64.27	9.60	0.56	0.81
	Total	**726**	**199**	**41**	**57**

Fire Damage

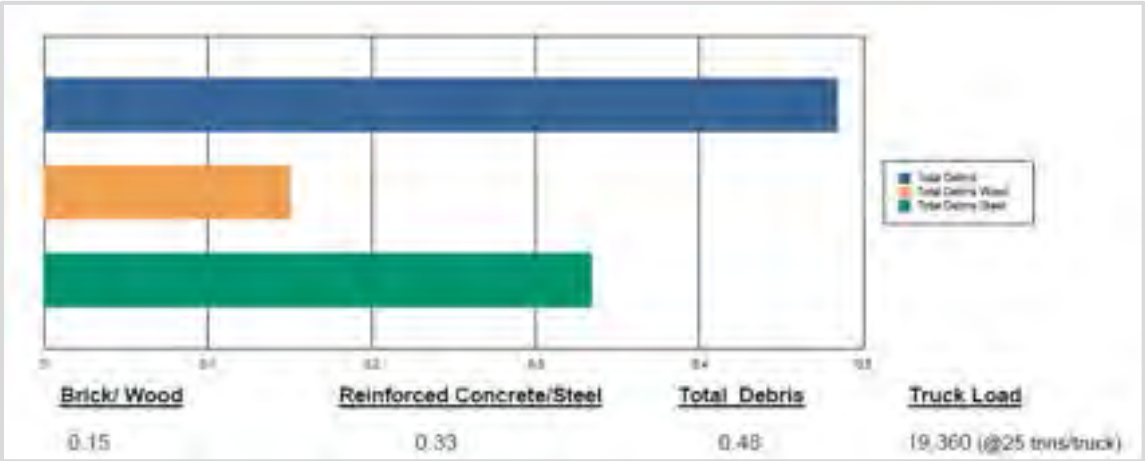
Fires often occur following an earthquake, due to downed power lines, ruptured fuel lines or other flammable materials becoming exposed and ignited. In the wake of an earthquake water may not be immediately available or may be available in limited quantities. Additionally, emergency personnel may be stretched thin and responding to other emergency situations. These factors increase the hazard that such fires pose to Pomona. This HAZUS scenario modeled

three fire ignitions in the City, resulting in the displacement of an additional 506 people and thirty-one million dollars of property damage.

Debris

The HAZUS-MH scenario produced an estimated 484,000 tons of debris. Following an earthquake, the City would need to devote resources to cleaning up brick, glass, wood, steel or concrete building elements, office and home contents, and other materials. This challenge includes disposing of or recycling the waste in compliance with the regulations of AB 939: The Integrated Waste Management Act. For these reasons, developing a strong debris management strategy is essential in post-disaster recovery.

Table 4-7: Earthquake Debris (millions of tons)



Direct Economic Impacts

The total estimated economic loss to the City in this scenario was 2.5 billion dollars. The economic losses calculated by HAZUS-MH include both income (wage, capital related, rental, relocation) and capital (structural, non-structural, content, inventory) losses incurred by earthquake damage, as well as damage to transportation and utility lifelines. The majority of losses were caused by building-related losses, which totaled 2.3 billion dollars. Within that category, residential losses comprise the largest portion 51% primarily due to damage of single-family homes.

The aforementioned economic impacts do not include indirect impacts, long-term changes that occur as a result of direct impacts. Such impacts include losses due to business closures, employment changes, loss of tourism revenues, changes in sales tax revenues, or other long-term consequences of earthquake damage.

Table 4-8: Building Related Economic Loss Estimates (millions of dollars)

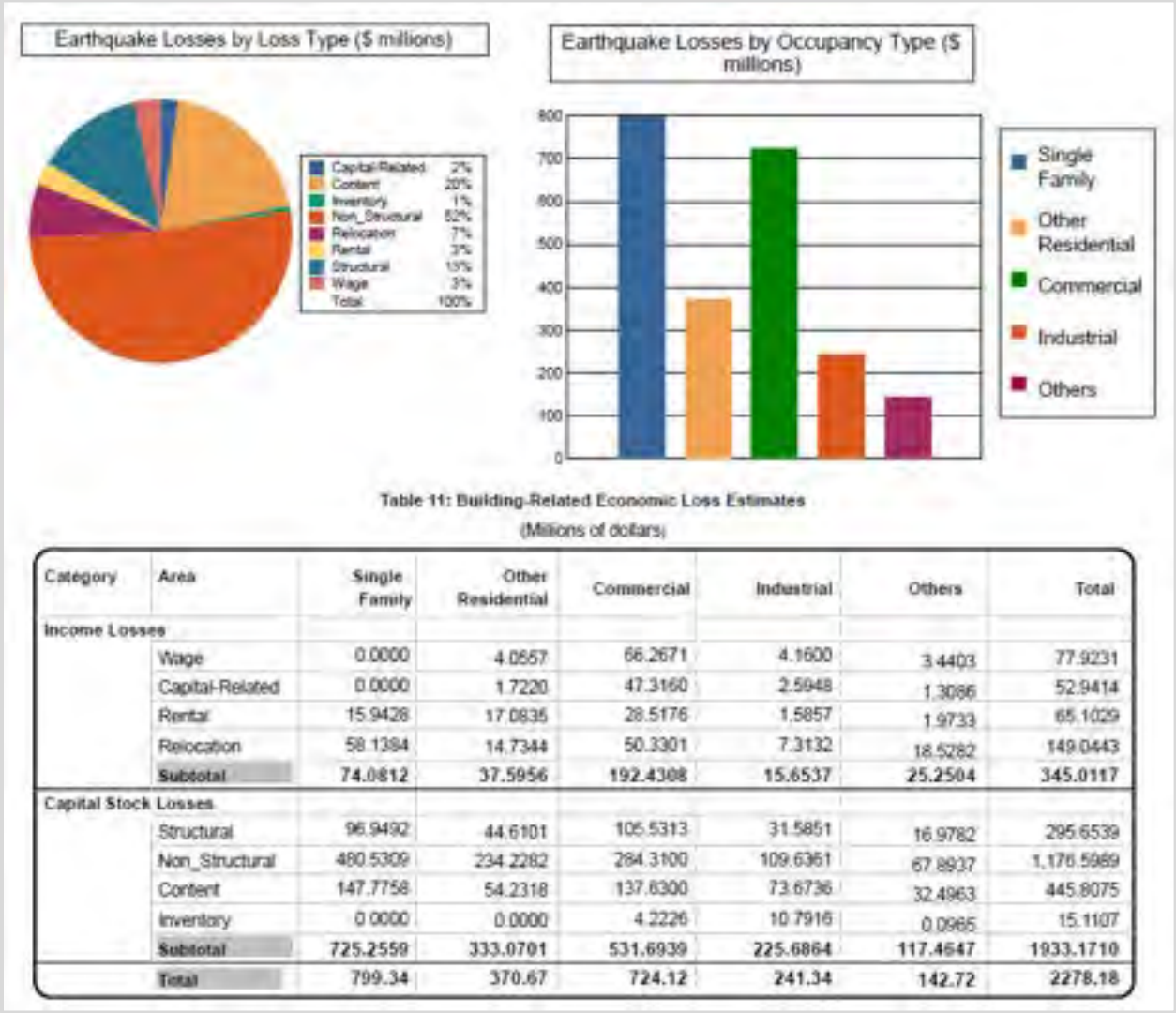


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	4.0657	66.2671	4.1600	3.4403	77.9231
	Capital-Related	0.0000	1.7220	47.3160	2.5948	1.3086	52.9414
	Rental	15.9428	17.0835	28.5176	1.5857	1.9733	65.1029
	Relocation	58.1384	14.7344	50.3301	7.3132	18.5282	149.0443
	Subtotal	**74.0812**	**37.5956**	**192.4308**	**15.6537**	**25.2504**	**345.0117**
Capital Stock Losses							
	Structural	96.9492	44.6101	105.5313	31.5851	16.9782	295.6539
	Non_Structural	480.5309	234.2282	284.3100	109.6361	67.8937	1,176.5989
	Content	147.7758	54.2318	137.6300	73.6736	32.4963	445.8075
	Inventory	0.0000	0.0000	4.2226	10.7916	0.0965	15.1107
	Subtotal	**725.2559**	**333.0701**	**531.6939**	**225.6864**	**117.4647**	**1933.1710**
	Total	**799.34**	**370.67**	**724.12**	**241.34**	**142.72**	**2278.18**

Additional Risk Analysis Factors

This HAZUS scenario did not model the potential effects of liquefaction or earthquake-induced landslides, which are important secondary hazards associated with earthquakes. Of the two hazards, liquefaction presents a more serious risk to the City. It covers a widespread area, unlike the localized hazard of landslides, and includes many important lifelines that could be damaged due to liquefaction. **Table 4-9**, below, lists the total structural assets that are located within these secondary earthquake hazards areas.

Table 4-9: Structures within Liquefaction and Landslide Zones

LAND USE	UNITS	STRUCTURE VALUE (IN MILLIONS)	ACRES	UNITS	STRUCTURE VALUE (IN MILLIONS)	ACRES
Low Density Residential	5437	402.3	924.3	144	24.1	328
Medium Density Residential	988	47.4	121.4	17	1.3	3.8
High Density Residential	595	19.8	21.1			
Automotive, Motel, & Service Commercial	129	12.4	33.6			
Retail Commercial & Shop Centers	28	46.0	109.6			
Office	15	38.8	38.4			
Light Industrial	65	127.7	243.7			
Heavy Industrial & Outdoor Storage	99	30.8	143.7			
Parks & Open Space	N/A	N/A	86.0	N/A		253.8
Education	3	0.1	509.7			N/A
Public, Civic & Institutional	4	120.1	718.4			
Vacant Land		N/A	61.1	N/A		
Total	**7,364**	**846.6**	**3,011.1**	**161**	**25.4**	**325.3**

4.3.3 CLIMATE CHANGE IMPACT

Scientists are currently studying the impacts of climate change on seismic activity. While increased temperatures are not linked to an increased risk of earthquake occurrence, scientists are currently studying the seismic consequences of water and how climate change may factor into such phenomena as drought[25]. Furthermore, climate change may amplify the secondary effects of earthquakes, including increasing temperatures which could intensify fire risks, or contribute to drought which in turn dries out vegetation and affects available water supply, which

[25] *Source: https://climate.nasa.gov/news/2926/can-climate-affect-earthquakes-or-are-the-connections-shaky/, accessed November 4, 2021*

could further constrain firefighting efforts during fires caused by an earthquake. Droughts exacerbated by climate change can also lead to subsidence, that could intensify damage resulting from an earthquake.

5 Landslides

5.1 INTRODUCTION

Landslides are a serious geologic hazard in almost every state in America. Nationally, landslides cause 25 to 50 deaths each year.[26] The best estimate of direct and indirect costs of landslide damage in the United States range between $1 and $2 billion annually.[27] Some landslides result in private property damage, while other landslides impact transportation corridors, fuel and energy conduits, and communication facilities. They can also pose a serious threat to human life. California has had a significant number of locations impacted by landslides, attributable to a variety of conditions present in the state: seismic activity, heavy seasonal participation, rapid development, and varied topography. Landslides resulting from these types of conditions are discussed in this chapter, while earthquakes-induced landslides are addressed in **Chapter 4 Earthquakes.**

5.2 HAZARD PROFILE

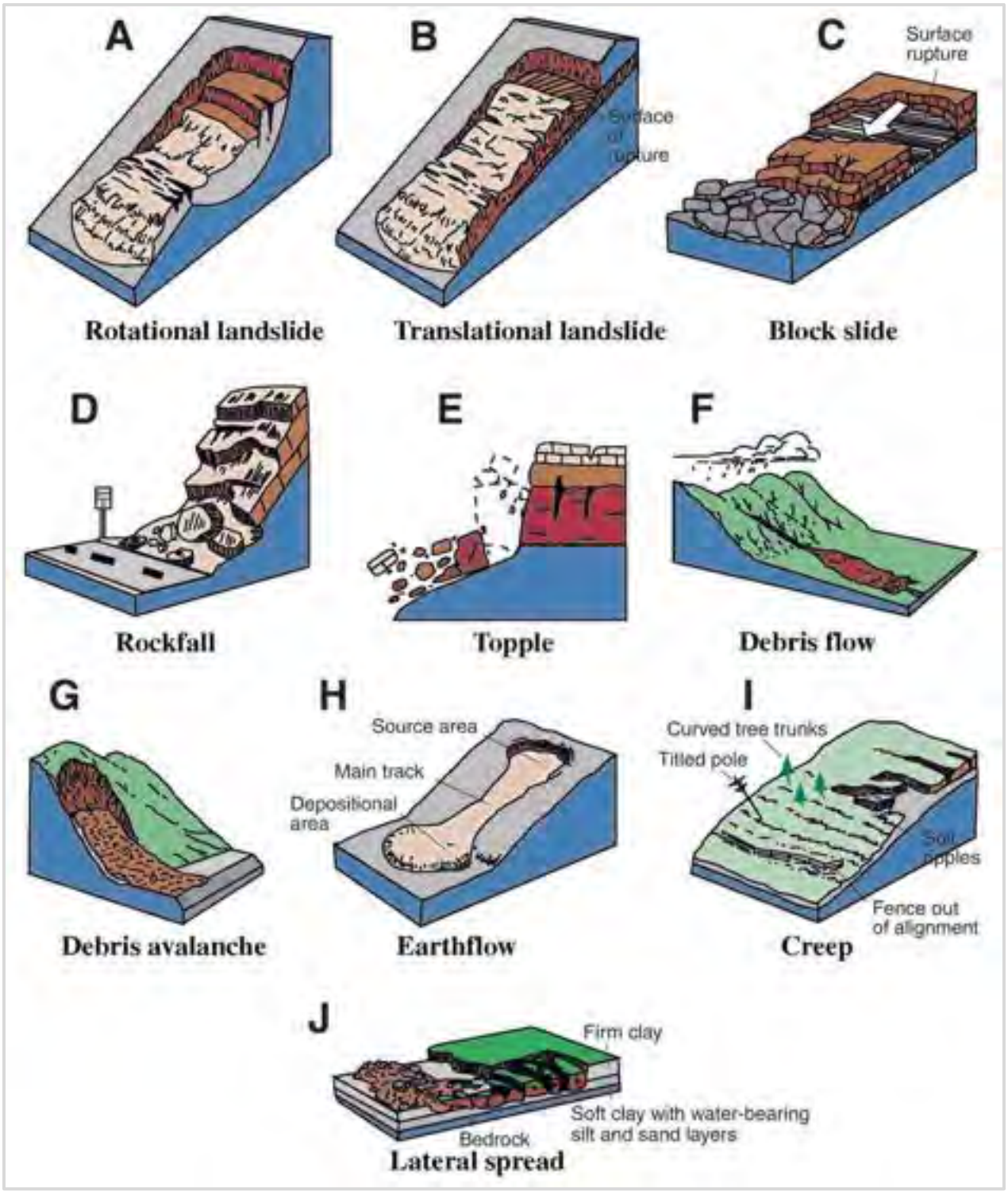
HAZARD DESCRIPTION

A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Landslides are a type of “mass wasting" which denotes any downslope movement of soil and rock under the direct influence of gravity. Failure of a slope occurs when the force that is pulling the slope downward (gravity) exceeds the strength of the earth materials that compose the slope. They can move slowly, (Millimeters per year) or quickly and disastrously, as is the case with debris flows.

The term "landslide" encompasses events such as rock falls, topples, slides, spreads, and flows. Landslides can be initiated by rainfall, earthquakes, volcanic activity, changes in groundwater, disturbance and change of a slope by man-made construction activities, or any combination of these factors. Landslides can also occur underwater, causing tidal waves and damage to coastal areas. These landslides are called submarine landslides.[28]

[26] *https://www.usgs.gov/faqs/how-many-deaths-result-landslides-each-year?qt-news_science_products=0#qt-news_science_products, accessed November 2021*
[27] *Brabb, E.E., and B.L Harrod. (Eds) Landslides: Extent and Economic Significance. Proceedings of the 28th International Geological Congress Symposium on Landslides. (1989) Washington D.C., Rotterdam: Balkema.*
[28] *Landslide Hazards, U.S. Geological Survey Fact Sheet 0071-00, Version 1.0, U.S. Department of the Interior - U.S. Geological Survey, http://pubs.usgs.gov/fs/fs-007 l-00/*

Figure 5-1: Landslide Types



Source: https://www.nps.gov/articles/monitoring-slope-movements.htm, National Park Service webpage, accessed December 2021.

The size of a landslide usually depends on the geology and the initial cause of the landslide. Landslides vary greatly in their volume of rock and soil, the length, width, and depth of the area affected, frequency of occurrence, and speed of movement. Some characteristics that determine the type of landslide are slope of the hillside, moisture content, and the nature of the underlying materials. Landslides are given different names, depending on the type of failure and their composition and characteristics.

Landslides can be broken down into two categories: (I) rapidly moving-generally known as debris flows-and (2) slow moving. Rapidly moving debris flows present the greatest risk to human life, and people living in or traveling through areas prone to rapidly moving landslides are at increased risk of serious injury. Due to their sluggish rate of movement, slow moving landslides typically do not result in loss of life but can cause widespread property damage over time.

Debris Flows

A debris flow - also known as a mud flow - is a semi-fluid mass of rock, earth, vegetation, and other materials that is saturated with water. This high percentage of water gives the debris flow a very rapid rate of movement down a slope. Although debris flows can travel down a hillside of speeds up to 200 miles per hour, speeds more commonly range 30 -50 miles per hour. Travel rates depend on the slope angle, water content, and type of earth and debris in the flow.

This high rate of speed makes debris flows extremely dangerous to people and property in its path. Earthquakes often trigger debris flows, as discussed in **Chapter 4 Earthquakes**. These flows are also initiated by heavy, usually sustained, periods of rainfall, but sometimes can happen as a result of short bursts of concentrated rainfall in susceptible areas. Burned areas charred by wildfires are particularly susceptible to debris flows, given certain soil characteristics and slope conditions.[29]

Slow Moving Landslides

Landslides move in contact with the underlying surface. These movements include rotational slides where sliding material moves along a curved surface, and translational slides where movement occurs along a flat surface. These types of slides are generally slow moving and can be deep. Slumps are small rotational slides that are generally shallow. Slow-moving landslides can occur on relatively gentle slopes and can cause significant property damage over time but are far less likely to result in serious injuries than rapidly moving landslides.[30] The best-known example of a slow-moving landslide in Southern California is the Portuguese Bend translational landslide. This event was initially triggered in the 1950s due to road construction and continues

[29] *https://www.usgs.gov/faqs/what-should-i-know-about-wildfires-and-debris-flows?qt-news_science_products=0#qt-news_science_products, accessed November 2021*
[30] *https://www.usgs.gov/natural-hazards/landslide-hazards/science/slow-motion-landslides?qt-science_center_objects=0#qt-science_center_objects, accessed November 2021*

to move even today.[31] This landslide and other historic occurrences are discussed in more detail in the following section.

5.2.1 HISTORIC EVENTS

There are portions of the City of Pomona which are susceptible to landslides and should be mitigated accordingly. The City has a history of landslide events:

CITY OF POMONA

March 2003, Ganesha Park

In March 2003, a landslide occurred in Ganesha Park. The slide caused temporary closure of Paige Drive, which runs alongside the park's popular recreation center. The City commissioned a geotechnical study to investigate the event. It was determined that a buildup of water in the soil- due to irrigation and unexpectedly heavy rainfall- helped to trigger the landslide (in addition to landslides, Ganesha Park also harbors wildfire hazards, and regular irrigation is used to reduce fire threat in the area). Although there was not any significant damage caused by the event, it underscores the vulnerability of local slopes to this type of natural hazard.

February 2005, Phillips Ranch

In February of 2005, a landslide occurred in Phillips Ranch in the area of Meadow View Drive following unprecedented heavy rains. The landslide resulted in six homes being damaged or destroyed and approximately $6 million in damages.

February 2010, 57 & 10 Freeways

In 2010, a landslide occurred near the intersection of the 57 and 10 Freeways, at the transition road from the westbound San Bernardino (10) Freeway to the northbound Orange (57) Freeway in Pomona.[32]

[31] *https://www.rpvca.gov/719/Landslide-Management-Program, accessed November 2021*
[32] *https://www.dailynews.com/2010/02/19/geologists-to-study-pomona-landslide/, accessed November 2021*

Figure 5-2: Pomona Landslide 2010



SOUTHERN CALIFORNIA

In addition to local events, the following examples of historic events in the Southern California region provide baseline information to help understand the types of vulnerabilities and potential damage associated with landslides.[33]

1928, St. Francis Dam Failure Los Angeles County

Built atop the site of an ancient landslide, the dam gave way on March 12, 1928. Its waters swept through the Santa Clara Valley toward the Pacific Ocean, about 54 miles away. Sixty-five miles of the valley were devastated, and over 500 people were killed. Damages were estimated at $672.1 million (year 2000 dollars).

1956, Portuguese Bend Palos Verdes Peninsula

Land use on the Palos Verdes The Portuguese Bend landslide began its modern movement in August 1956, when displacement was noticed at its northeast margin. Movement gradually

[33] *Highland. L.M. and Schuster. R.L. Significant Landslide Events United States. USGS. Washington D.C., http://landslides.usgs.gov. html_files/pubs/report I /Landslides_ pa.*

extended downslope so that the entire eastern edge of the slide mass was moving within 6 weeks. By the summer of 1957, the entire slide mass was sliding towards the sea. This slow-moving landslide continues its movement in the area and is, even today, continuing to threaten the residential community that exists there. The estimated cost thus far is $14.6 million (2000 dollars).

1969, Glendora Los Angeles County

175 houses damaged, mainly by debris flows. Estimated cost: $26.9 million (2000 dollars).

1969, Seventh Ave., Los Angeles County

Damage to California Highway 60. Estimated cost: $14.6 million (2000 dollars).

1970, Princess Park California Highway 14

10 miles north of Newhall, near Saugus, northern Los Angeles County. Estimated cost: $29.1 million (2000 dollars).

1977-1980, Monterey Park. Repetto Hills, Los Angeles County

100 houses damaged in 1980 due to debris flows. Estimated cost: $14.6 million (2000 dollars).

1978, Bluebird Canyon, Orange County

60 houses destroyed or damaged. Unusually heavy rains in March of 1978 may have contributed to initiation of the landslide. Although the 1978 slide area was approximately 3.5 acres, it is suspected to be a portion of a larger, ancient landslide. Estimated cost: $52.7 million (2000 dollars).

1979, Big Rock, California, Los Angeles County

California Highway 1 rockslide. Estimated cost: approximately $1.08 billion (2000 dollars).

1980, Southern California

Estimated cost: $1.1 billion in damage (2000 dollars). Heavy winter rainfall in 1979-80 caused damage in six Southern California counties. In 1980, the rainstorm started on February 8. A sequence of 5 days of continuous rain and 7 inches of precipitation had occurred by February 14. Slope failures were beginning to develop by February 15 and then very high intensity rainfall occurred on February 16. As much as 8 inches of rain fell in a 6-hour period in many locations. Records and personal observations in the field on February 16 and 17 showed that the mountains and slopes literally fell apart on those 2 days. Estimated cost: $1.1 billion in damage (2000 dollars).

1983, San Clemente, California, Orange County. California Highway 1

Litigation at that time involved approximately $43.7 million (2000 dollars). Estimated cost: $65

million (2000 dollars).

1978-1980, San Diego County

Experienced major damage from storms in 1978, 1979, and 1979-80, as did neighboring areas of Los Angeles and Orange County, California. One hundred and twenty landslides were reported to have occurred in San Diego County during these 2 years. Rainfall for the rainy seasons of 78-79 and 79-80 was 14.82 and 15.61 inches (37.6 and 39.6 cm) respectively, compared to a 125-year average (1850-1975) of 9.71 inches (24.7 cm). Significant landslides occurred in the Friars Formation; a unit that was noted as slide-prone in the Seismic Safety Study for the City of San Diego. Of the nine landslides that caused damage in excess of $ I million, seven occurred in the Friars Formation, and two in the Santiago Formation in the northern part of San Diego County.

1995, Los Angeles and Ventura Counties

Above normal rainfall triggered damaging debris flows, deep-seated landslides, and flooding. Several deep-seated landslides were triggered by the storms, the most notable was the La Conchita landslide, which in combination with a local debris flow, destroyed or badly damaged 11 to 12 homes in the small town of La Conchita, about 20 km west of Ventura. There also was widespread debris flow and flood damage to homes, commercial buildings, and roads and highways in areas along the Malibu coast that had been devastated by wildfire two years before.

2005, Los Angeles and Ventura Counties

A subsequent landslide to the March 1995 landslide in La Conchita, this disaster resulted in 10 fatalities and the destruction of 13 homes and damage of 23 additional homes. The 2005 landslide occurred at the end of a 15-day period that produced record and near-record amounts of rainfall in many areas of southern California.[34]

2018, Montecito, Santa Barbara County

The most recent large devastating landslide event in California occurred in Montecito in Santa Barbara County on January 29, 2018. Twenty-three people were killed, at least 167 injured, and more than 400 homes were damaged by a series of debris flows. The debris flows were triggered by heavy rain that fell on steep hillsides that had been burned by the Thomas Wildfire, which at that time was the largest wildfire in California history.[35]

5.2.2 HAZARD LOCATION AND EXTENT

Most of Pomona is located on a flat alluvial plain, and therefore not subject to landslide hazards. However, hillsides in the western portion of the City are considered susceptible to landslides and

[34] *https://pubs.usgs.gov/of/2005/1067/508of05-1067.html#conchita05, accessed November 2021*
[35] *https://www.usgs.gov/faqs/how-many-deaths-result-landslides-each-year?qt-news_science_products=0#qt-news_science_products, accessed November 2021*

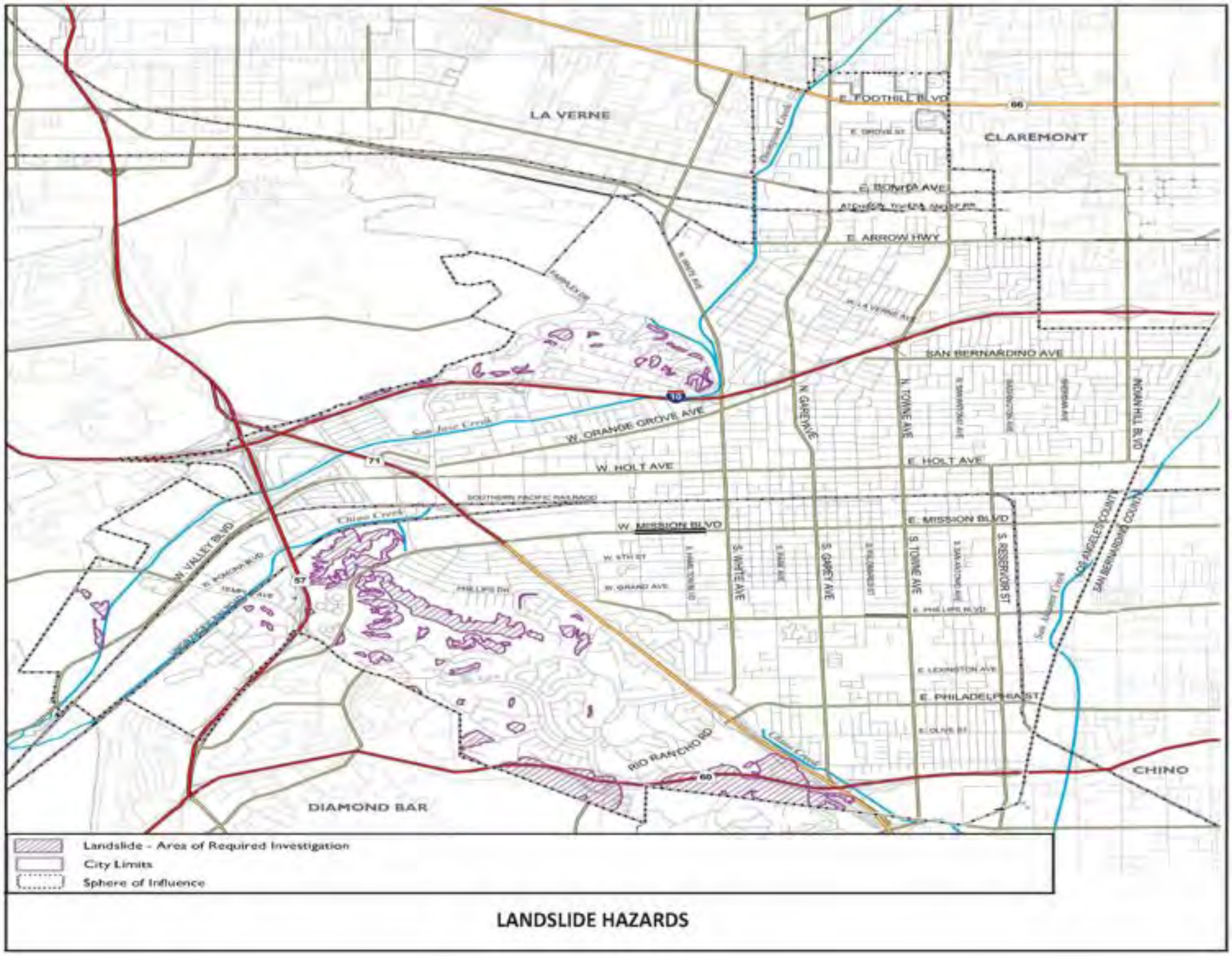
could sustain loss of life and property from this natural hazard. Initial mapping efforts have been conducted by the USGS to determine those areas in the City that have conditions conducive to landslides. **Map 5-1** displays relative susceptibility to landslides, as well as locations where landslides may be triggered by earthquake (this latter information is also mapped in **Map 4-1 Seismic Hazards**). This figure also includes the hillside area addressed in the City's Zoning Ordinance, which is further discussed in **Section 11.2.2 Existing Landslide Mitigation Activities**.

The landslide maps produced by the USGS are an invaluable asset to the City in identifying hazards and preparing mitigation measures. However, these maps were not prepared specifically for Pomona and may not provide the level of detail needed to identify all potentially hazardous areas. Additionally, changing local conditions associated with development may increase the potential for landslides to occur, and this dynamic nature of the hazard is not reflected in these published maps.

An awareness of the conditions that give rise to landslides will assist City officials in making prudent decisions about mitigation measures and regulating future development in areas at-risk to landslides. In general, locations at risk from landslides or debris flows include areas with one or more of the following conditions:

- On or close to steep hills;
- Steep road-cuts or excavations;
- Existing landslides or places of known historic landslides (such sites often have tilted powerlines, trees tilted in various directions, cracks in the ground, and irregular-surfaced ground);
- Steep areas where surface runoff is channeled, such as below culverts, V -shaped valleys, canyon bottoms, and steep stream channels;
- Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons; or
- Canyon areas below hillside and mountains that have recently (within one to six years) been subjected to a wildland fire.

Map 5-1: Landslide Hazards



IMPACTS OF DEVELOPMENT

Although landslides are a natural occurrence, human impacts can substantially affect the potential for landslide failures. The increasing scarcity of developable land, particularly in urban areas, increases the tendency to build on geologically marginal land. Additionally, hillside housing developments in Southern California are prized for the views that they provide. Given the demand for such amenities, and the hazards that are present when building in areas of potential landslides, it is essential to exercise proper planning and geotechnical engineering to reduce the threat of safety of people, property, and infrastructure.

Excavation and Grading

Slope excavation is common in the development of home sites or roads on sloping terrain. Grading these slopes can result in some slopes that are steeper than the pre-existing natural slopes. Since slope steepness is a major factor in landslides, these steeper slopes can be at an increased risk for landslides. The added weight of fill placed on slopes can also result in an increased landslide hazard. Small landslides can be fairly common along roads, in either the road cut or the road fill. Landslides occurring below new construction sites are indicators of the potential impacts stemming from excavation.

Drainage and Groundwater Alterations

Water flowing through or above ground is often the trigger for landslides. Any activity that increases the amount of water flowing into landslide-prone slopes can increase landslide hazards. Broken or leaking water or sewer lines can be especially problematic, as can water retention facilities that direct water onto slopes. However, even excessive lawn irrigation in landslide prone locations can result in damaging landslides.

Ineffective storm water management and excess runoff can also cause erosion and increase the risk of landslide hazards. Development that results in an increase in impervious surface impairs the ability of the land to absorb water and may redirect water to other areas. Channels, streams, ponding, and erosion on slopes all indicate potential slope problems. Road and driveway drains, gutters, downspouts, and other constructed drainage facilities can concentrate and accelerate flow. Ground saturation and concentrated velocity flow are major causes of slope problems and may trigger landslides.[36]

Changes in Vegetation

Removing vegetation from very steep slopes can increase landslide hazards. Areas that experience wildfire and land clearing for development may have long periods of increased landslide hazard. Also, certain types of ground cover have a much greater need for constant watering to remain green. Changing away from native ground cover plants may increase the risk

[36] *Homeowners Guide for Landslide Control. Hillside Flooding. Debris Flows, Soil Erosion. (March 1997).*

of landslide.

Conclusion

The geographic extent of landslide hazards in Pomona is relatively small, comprising only a small percentage of the total area of the City. Additionally, the communities present in this area have some of the lower housing densities in the City; the number of people that would be directly impacted by a landslide is estimated to be very low. However, due to the potential for loss of life and property damage that can be caused by landslides, the extent of this hazard could have far-reaching community effects.

5.2.3 PROBABILITY OF FUTURE OCCURRENCE

The probability of a landslide event is fairly low. The City of Pomona has experienced three notable landslide events in the past twenty years; however, hillside areas where landslides could occur account for a small geographic area of the city. Additionally, revisions to the hillside ordinance in 2010 year put additional constraints on new development to decrease the risk of landslides to people and property.

5.3 VULNERABLILITY ASSESSMENT

OVERVIEW

Hillsides where landslides could occur comprise a small portion of the City, but the presence of lifeline routes and many residences in these areas augment the risk of significant damage to the City and its inhabitants. Development in these hillsides increases the risks in locations that are naturally prone to landslides, and where ancient landslides have occurred in the past.

5.3.1 IDENTIFYING VULNERABILITIES

Landslides can affect structures, utility services, transportation lifelines, and critical facilities. Communities may suffer immediate damages and loss of service. Disruption of infrastructure, roads, and critical facilities may also have a long-term effect on the economy. Utilities, including potable water, wastewater, telecommunications, natural gas, and electric power are all essential to service community needs. Loss of electricity has the most widespread impact on other utilities and on the whole community. Natural gas pipes may also be at risk of breakage from landslide movements as small as an inch or two.

LIFELINES AND CRITICAL FACILITIES

No critical facilities are located within areas susceptible to landslides. However, disruption of a

major transportation lifeline could impair access to facilities in the City. To the greatest extent possible, lifelines and critical facilities should remain accessible during a natural hazard event. The impact of closed transportation arteries may be increased if the closed road or bridge is critical for hospitals and other emergency facilities. Therefore, inspection and repair of critical transportation facilities and routes is essential and should receive high priority. Primary transportation routes in Pomona that pass near hillsides at-risk to landslides are SR-57 and SR-60. Although debris that damaged or obstructed these routes would certainly have negative impacts on the flow of traffic, it would not be extremely adverse, as these routes do not pass through the center of the City and there are alternative corridors available should these become compromised. In addition, portions of the Union Pacific Railroad pass by areas that are susceptible to landslides. Debris on the tracks would delay both passenger and freight cargo, and potentially cause serious damage to the tracks.

RECREATION AND COMMUNITY CENTERS

As mentioned in **Chapter 4 Earthquakes**, the popular Ganesha Park is located near slopes susceptible landslides. In response to the landslide event of March 2003 in Ganesha Park (discussed above in the Historic Events portion of **Section 5.2 Hazard Profile**), the City evaluated the risk posed by slope movement, specifically to the park's swimming pool and community center. The City's geotechnical study asserted that in the event of a reoccurrence of slope failure at the site, the slide would be unlikely to reach the community center. The report concluded that this landslide area does not pose significant potential for loss of life or damage to the community center. In order to mitigate future occurrences from slope failure at the site, the City is in the process of requesting bids to implement recommendations contained in the geotechnical report.

VULNERABLE DEVELOPMENT PATTERNS

Fortunately, the majority of landslide-prone locations that have been mapped occur in areas of designated open space. However, nearby residential communities are at-risk to this hazard in portions of Phillips Ranch and of Ganesha Hills. These communities are largely developed, and any new development in these areas should be carefully evaluated to help avoid activities that increase landslide vulnerability.

5.3.2 ESTIMATING POTENTIAL LOSSES

Factors included in assessing landslide vulnerability include population and property distribution in the hazard area, the frequency of landslide or debris flow occurrences, slope steepness, soil characteristics, and precipitation intensity. This type of analysis could generate dollar estimates of the damages to the city due to a specific landslide or debris flow event. At the time of publication of this plan, data was insufficient to conduct a risk analysis and the software needed to conduct this type of analysis was not available.

5.3.3 CLIMATE CHANGE IMPACT

Climate change is a contributing factor for increased droughts, extreme storms, floods, and wildfire, all of which contribute to and can increase the rate and severity of landslides.[37]

[37] *https://climate.nasa.gov/effects/, accessed November 2021*

6 Wildfire

6.1 INTRODUCTION

For thousands of years, fires have been a natural part of the ecosystem in Southern California. However, wildfires present a substantial hazard to life and property in communities built within or adjacent to hillsides and mountainous areas. This risk is present wherever open space areas connect or 'interface' with urban and suburban areas. In California, the hot dry climate and large, mountainous wildland/urban interface area create a tremendous potential for losses due to wildfire.

In the last two decades, Californians have been sharply reminded of the devastating capabilities of wildfire. During this time, records have been broken and broken again in connection with total acres burned and lives and property lost.

6.2 HAZARD PROFILE

HAZARD DESCRIPTION

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly damaging or consuming structures. Wildfires often begin unnoticed and spread quickly, particularly in dry areas, and are usually signaled by dense smoke that fills the area for miles around. These fires are classified into two broad categories.

- A wildland fire is a wildfire in undeveloped areas, which excludes the urbanized regions.
- An urban-wildland interface fire is a wildfire in an area where the vegetative fuel meets or intermingles with wildlands or vegetative fuel.

Although Pomona is not adjacent to a large wildland area, Pomona contains some open space lands in the east. Although the amount of open space is small compared to developed lands in Pomona, the potential for wildland/urban interface fires poses a considerable hazard.

WILDFIRE CHARACTERISTICS

There are three categories of interface fire:[38]

- The classic wildland/urban interface exists where well defined urban and suburban development presses up against open expanses of wildland areas;

[38] *Planning for Natural Hazards: The Oregon Technical Resource Guide. (July 2000) Department of Land Conservation and Development.*

- The mixed wildland/urban interface is characterized by isolated homes, subdivisions and small communities situated predominantly in wildland settings; and
- The occluded wildland/urban interface exists where islands of wildland vegetation occur inside a largely urbanized area, as in the case of Pomona.

Certain conditions must be present for significant interface fires to occur. The most common conditions include hot, dry, and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started. several conditions influence its behavior, including fuel topography, weather, drought, and development.

Fuel

Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is classified by volume and by type. Volume is described in terms of "fuel loading', or the amount of available vegetative fuel.

The type of fuel also influences wildfire. Chaparral is a primary fuel of Southern California wildfires. Chaparral habitat ranges in elevation from near sea level to over 5,000 feet in Southern California. Chaparral communities experience long dry summers and receive most of their annual precipitation from winter rains. Although chaparral is often considered as a single species, there are two distinct types: hard chaparral and soft chaparral. Within these two types are dozens of different plants, each with its own particular characteristics.

An important element in understanding the danger of wildfire is the availability of diverse fuels in the landscape, such as natural vegetation, manmade structures, and combustible materials. A house surrounded by brushy growth rather than cleared space allows for greater continuity of fuel and increases the fire's ability to spread. After decades of fire suppression “dog-hair" thickets have accumulated, which enable high intensity fires to flare and spread rapidly.

Topography

Topography influences the movement of air, thereby directing a fire course. For example, if the percentage of uphill slope doubles, the rate of spread in wildfire will likely double. Gulches and canyons can funnel air and act as chimneys, which intensify fire behavior and cause the fire to spread faster. Solar heating of dry, south-facing slopes produces up slope drafts that can complicate fire behavior. Unfortunately, hillsides with hazardous topographic characteristics are also desirable residential areas in many communities. This underscores the need for wildfire hazard mitigation and increased education and outreach to homeowners living in interface areas.

Weather

Weather patterns combined with certain geographic locations can create a favorable climate for wildfire activity. Areas where annual precipitation is less than 30 inches per year are extremely

fire susceptible.[39] High risk areas in Southern California share a hot, dry season in late summer and early fall when high temperatures and low humidity favor fire activity. The "Santa Ana" winds, which are heated by compression as they flow down to Southern California from Utah, create a particularly high risk, as they can rapidly spread what might otherwise be a small fire.

Drought

Recent concerns about the effects of climate change - particularly drought - are contributing to concerns about wildfire vulnerability. The term drought is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance. Unusually dry winters, or significantly less rainfall than normal, can lead to relatively drier conditions and leave reservoirs and water tables lower. Drought leads to problems with irrigation and may contribute to additional fires, or additional difficulties in fighting fires.

Development

Wildfire has an effect on development, yet development can also influence wildfire. Owners often prefer homes that are private, have scenic views are nestled in vegetation and use natural materials. A private setting may be far from public roads, or hidden behind a narrow, curving driveway. These conditions, however, make evacuation and firefighting difficult. The scenic views found along mountain ridges can also mean areas of dangerous topography. Natural vegetation contributes to scenic beauty, but it may also provide a ready trail of fuel leading a fire directly to the combustible fuels of the home itself.

6.2.1 HISTORIC EVENTS

Large fires have been part of the Southern California landscape for millennia. Written documents reveal that during the 19th Century human settlement of southern California altered the fire regime of coastal California by increasing the fire frequency. This was an era of very limited fire suppression, and yet like today, large crown fires covering tens of thousands of acres were not uncommon. One of the largest fires in Los Angeles County (60,000 acres) occurred in 1878, and the largest fire in Orange County's history, in 1889, was over half a million acres.[40]

2003 SOUTHERN CALIFORNIA FIRES

The fall of 2003 marked the most destructive wildfire season to that date in California history. In a ten-day period, 12 separate fires raged across Southern California in Los Angeles, Riverside, San Bernardino, San Diego, and Ventura counties. The massive "Cedar Fire" in San Diego County consumed 2,800 homes and burned over a quarter of a million acres. Although the 2003 fires did not reach Pomona, they did burn areas of the adjacent city of Claremont, and Santa Ana winds blew heavy smoke into Pomona.

[39] *Ibid.*
[40] *http://www.usgs.gov/public/press/public_affairs/press_releases/pr1805m.html, accessed November 2021.*

2007 SOUTHERN CALIFORNIA FIRES

In late October 2007, Southern California experienced an unusually severe fire weather event characterized by intense, dry, gusty Santa Ana winds. This weather event drove a series of destructive wildfires that took a devastating toll on people, property, natural resources, and infrastructure. Although some fires burned into early November, the heaviest damage occurred during the first three days of the siege when the winds were the strongest. During this siege, 17 people lost their lives, ten were killed by the fires outright, three were killed while evacuating, four died from other fire siege related causes, and 140 firefighters and an unknown number of civilians were injured. A total of 3,069 homes and other buildings were destroyed, and hundreds more were damaged. Hundreds of thousands of people were evacuated at the height of the siege.

The fires burned over half a million acres, including populated areas, wildlife habitats and watersheds. Portions of the electrical power distribution network, telecommunications systems, and even some community water sources were destroyed. Transportation was disrupted over a large area for several days, including numerous road closures. Both the Governor of California and the President of the United States personally toured the ongoing fires. Governor Schwarzenegger proclaimed a state of emergency in seven counties before the end of the first day. President Bush quickly declared a major disaster. While the total impact of the 2007 fire siege was less than the disastrous fires of 2003, it was unquestionably one of the most devastating wildfire events in the history of California.[41]

2017-2020 SOUTHERN CALIFORNIA FIRES

In terms of property damage, 2017 was the most destructive wildfire season on record in California at the time. Throughout 2017, the fires destroyed or damaged more than 10,000 structures in the state (destroyed 9,470, damaged 810), a higher tally than the previous nine years combined. In total 9,133 fires burned 1,248,606 acres. In December 2017, strong Santa Ana winds triggered a new round of wildfires, including the massive Thomas Fire in Ventura County. At the time, the Thomas Fire was California's largest modern wildfire, which has since been surpassed by the Mendocino Complex's Ranch Fire in 2018. The December 2017 fires forced over 230,000 people to evacuate. 2017 will be remembered as a year of extremes. It was the third-warmest year on record for the United States, and it was the second hottest in California, bringing to the surface the question of long-term climate change and its contribution to the 2017 California fires. The hotter temperatures dry out vegetation, making them easier to burn, predisposing vulnerable regions like California to more wildfires in the coming decades as temperatures continue to rise and rainfall continues to decline.[42]

The 2018 wildfire season was the deadliest and most destructive wildfire season on record in California, with a total of over 7,500 fires burning an area of over 1,670,000 acres. In mid-July to August 2018, a series of large wildfires erupted across California, mostly in the northern part of the state. In November 2018, another round of large, destructive fires launched including the Woolsey Fire in Los Angeles and Ventura counties and the Camp Fire in Butte County, which killed at least 85 people.[43]

While 2019 was a relatively mild fire season, it should be noted that Pacific Gas & Electric, Southern

[41] *http://www.fire.ca.gov/fire_protection/downloads/siege/2007/Overview_Introduction.pdf), accessed November 2021*
[42] *https://www.fire.ca.gov/incidents/2017/, accessed November 2021*
[43] *https://www.fire.ca.gov/incidents/2018/, accessed November 2021*

California Edison, and San Diego Gas & electric preemptively shut off power to 800,000 electrical customers to reduce the risk of wildfires by preventing electrical arcing in high winds from their above-ground power lines.[44]

The 2020 California wildfire season was characterized by a record-setting year of wildfires that burned across the state. As of the end of the year, nearly 10,000 fires had burned over 4.2 million acres, more than 4% of the state's roughly 100 million acres of land, making 2020 the largest wildfire season recorded in California's modern history.[45]

6.2.2 HAZARD LOCATION AND EXTENT

Wildfire hazard areas are commonly identified in regions of the wildland/urban interface. In Pomona, this interface is present in the western and southwestern hills. The California Department of Forestry and Fire Protection (CDF) maps levels of fire threat base on groundcover and topography. The increased threat of fires in the hilly areas of Pomona is illustrated in **Map 6-1,** with portions of the Phillips Ranch and Ganesha Hills areas obtaining a "High" and "Very High" level of fire threat. The rest of the City is considered to have a "Moderate" threat of fire as mapped by this system.[46] While groundcover and topography are the primary indices of fire vulnerability, there are other factors that can greatly influence the severity of a fire. Dry weather conditions, the natures of the fuel sources, the presence or absence of drought conditions, and the types of development present all have impacts on fire hazards. In Pomona, the critical times of the year when wildland fires could occur are the late summer and fall months, as the Santa Ana winds deliver hot, dry desert air into the region.

6.2.3 PROBABILITY OF FUTURE EVENTS

Although the probability of future wildfires in the region is high, the fire risk areas of Pomona are largely isolated from the fire prone mountainous areas in the region. Therefore, the probability of large wildfires in the San Gabriel Mountains or other large open space areas in the region spreading to Pomona is not considered a high probability event. However, the City does have large areas of fire risk, particularly in the southwestern corner of the City (in Phillips Ranch, and Cal Poly Pomona areas) and in the Ganesha Hills area. Provided with the right combination of factors (dry vegetation, Santa Ana winds), even a small fire could quickly spread and threaten nearby development.

6.3 VULNERABILITY ASSESSMENT

OVERVIEW

[44] *https://www.fire.ca.gov/incidents/2019/, accessed November 2021*
[45] *https://www.fire.ca.gov/incidents/2020,/, accessed November 2021*
[46] *California Department of Forestry and Fire Protection. website: http://frap.cdf.ca.gov/data/frapgismaps/select.asp, accessed June 6. 2004*

As a highly urbanized area, the risk of wildfire is limited to localized areas (see **Map 6-1**). The probability is very low however, in those areas where the risk from wildfire is considered high, there are a number of vulnerabilities that should be considered in the mitigation planning process. As building recovery continues the area of open space is rapidly diminishing. Very few open areas remain and those are on hillsides with strict building codes to mitigate fire risks.

6.3.1 IDENTIFYING VULNERABILITIES

There are two critical facilities located within a High Threat Zone, and several vulnerable public and private schools. Parts of Cal Poly Pomona are also vulnerable to wildfire. Factors that decrease a structures resistance to fire include combustible roofing material, wood construction, structures with no defensible space, and inadequate access for fire and other emergency vehicles. The highest rated risks from wildfire in Pomona are the residential communities near the wildland/urban interface. Not only are communities in Phillips Ranch and Ganesha Hills subject to fire risk due to prevalence of open spaces combined with steep slopes, but neighborhoods on the outskirts of fire hazard areas can be impacted by fire. This risk increases during Santa Ana wind conditions, with potential for property damage, injury, and fatalities. There are also a small number of facilities and assets that are considered to be at medium risk from wildfires in Pomona. These include the following:

- *Diamond Ranch High School*. The school is located in an area identified with a potential for wildfire. However, the modern building standards used in construction (including noncombustible materials) reduce the potential for damage to the facility.
- *Cal Poly Pomona*. The open spaces around Cal Poly Pomona create the potential for high fire hazard.

6.3.2 ESTIMATING POTENTIAL LOSSES

The primary vulnerability in Pomona to wildfire is development within High or Very High Fire Threat Zones. However, it should be considered that the actual risk to these structures is dependent on a number of factors, most notably construction type, building standards, how a fire spreads, and the response from local fire crews.

6.3.3 CLIMATE CHANGE IMPACT

Climate change is increasing the frequency and severity of wildfires in California. Since 1950, the area burned by California wildfires each year has been increasing, as spring and summer temperatures have warmed, and spring snowmelt has occurred earlier. During the recent "hotter" drought, unusually warm temperatures intensified the effects of very low precipitation and snowpack, creating conditions for extreme, high severity wildfires that spread rapidly. Of the

20 largest fires in California's history, eight have occurred since 2017.[47] The 2020 August Complex Fire is now the largest recorded wildfire in California, more than doubling the 2018 Mendocino Complex Fire's size to become California's largest recorded wildfire.[48]

[47] *https://science2017.globalchange.gov/chapter/8/, accessed November 2021*
[48] *Note: As of the preparation of this report, the Dixie Fire in Northern California has surpassed the August Complex Fire to become the largest in the state's history. As of August 25, 2021, CalFIRE reported more than 735,000 acres burned across five counties. Source: https://www.fire.ca.gov/incidents/2021/7/14/dixie-fire/*

Figure 6-1: Top 20 Largest California Wildfires

	FIRE NAME (CAUSE)	DATE	COUNTY	ACRES	STRUCTURES	DEATHS
1	AUGUST COMPLEX *(Lightning)*	August 2020	Mendocino, Humboldt, Trinity, Tehama, Glenn, Lake, & Colusa	1,032,648	935	1
2	DIXIE *(Under Investigation)*	July 2021	Butte, Plumas, Lassen, Shasta & Tehama	963,309	1,329	1
3	MENDOCINO COMPLEX *(Human Related)*	July 2018	Colusa, Lake, Mendocino & Glenn	459,123	280	1
4	SCU LIGHTNING COMPLEX *(Lightning)*	August 2020	Stanislaus, Santa Clara, Alameda, Contra Costa, & San Joaquin	396,624	222	0
5	CREEK *(Undetermined)*	September 2020	Fresno & Madera	379,895	853	0
6	LNU LIGHTNING COMPLEX *(Lightning/Arson)*	August 2020	Napa, Solano, Sonoma, Yolo, Lake, & Colusa	363,220	1,491	6
7	NORTH COMPLEX *(Lightning)*	August 2020	Butte, Plumas & Yuba	318,935	2,352	15
8	THOMAS *(Powerlines)*	December 2017	Ventura & Santa Barbara	281,893	1,063	2
9	CEDAR *(Human Related)*	October 2003	San Diego	273,246	2,820	15
10	RUSH *(Lightning)*	August 2012	Lassen	271,911 CA / 43,666 NV	0	0
11	RIM *(Human Related)*	August 2013	Tuolumne	257,314	112	0
12	ZACA *(Human Related)*	July 2007	Santa Barbara	240,207	1	0
13	CARR *(Human Related)*	July 2018	Shasta County & Trinity	229,651	1,614	8
14	MONUMENT *(Lightning)**	July 2021	Trinity	223,124	50	0
15	CALDOR *(Under Investigation)*	August 2021	Alpine, Amador, & El Dorado	221,835	1,003	1
16	MATILIJA *(Undetermined)*	September 1932	Ventura	220,000	0	0
17	RIVER COMPLEX *(Lightning)**	July 2021	Siskiyou & Trinity	199,343	102	0
18	WITCH *(Powerlines)*	October 2007	San Diego	197,990	1,650	2
19	KLAMATH THEATER COMPLEX *(Lightning)*	June 2008	Siskiyou	192,038	0	2
20	MARBLE CONE *(Lightning)*	July 1977	Monterey	177,866	0	0

There is no doubt that there were fires with significant acreage burned in years prior to 1932, but those records are less reliable, and this list is meant to give an overview of the large fires in more recent times.
This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.
*Numbers not final.

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Figure 6-2: Top 20 Deadliest California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	**CAMP FIRE** *(Powerlines)*	November 2018	Butte	153,336	18,804	**85**
2	**GRIFFITH PARK** *(Unknown)*	October 1933	Los Angeles	47	0	**29**
3	**TUNNEL - Oakland Hills** *(Rekindle)*	October 1991	Alameda	1,600	2,900	**25**
4	**TUBBS** *(Electrical)*	October 2017	Napa & Sonoma	36,807	5,643	**22**
5	**NORTH COMPLEX** *(Lightning)*	August 2020	Butte, Plumas, & Yuba	318,935	2,352	**15**
6	**CEDAR** *(Human Related)*	October 2003	San Diego	273,246	2,820	**15**
7	**RATTLESNAKE** *(Arson)*	July 1953	Glenn	1,340	0	**15**
8	**LOOP** *(Unknown)*	November 1993	Los Angeles	2,028	0	**12**
9	**HAUSER CREEK** *(Human Related)*	October 1943	San Diego	13,145	0	**11**
10	**INAJA** *(Human Related)*	November 1956	San Diego	43,604	0	**11**
11	**IRON ALPS COMPLEX** *(Lightning)*	August 2008	Trinity	105,855	10	**10**
12	**REDWOOD VALLEY** *(Power Lines)*	October 2017	Mendocino	36,523	544	**9**
13	**HARRIS** *(Undetermined)*	October 2007	San Diego	90,440	548	**8**
14	**CANYON** *(Unknown)*	August 1968	Los Angeles	22,197	0	**8**
15	**CARR** *(Human Related)*	July 2018	Shasta County, Trinity	229,651	1,614	**8**
16	**LNU Lightning Complex** *(Lightning/Arson)*	August 2020	Napa/Sonoma/Yolo/Stanislaus/ Lake	363,220	1,491	**6**
17	**ATLAS** *(Powerline)*	October 2017	Napa & Solano	51,624	781	**6**
18	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	1,003	**6**
19	**DECKER** *(Vehicle)*	August 1959	Riverside	1,423	1	**6**
20	**HACIENDA** *(Unknown)*	September 1955	Los Angeles	1,100	0	**6**

** Fires with the same death count are listed my most recent. Several fires have had 4 fatalities, but only the most recent are listed.
***This list does not include fire jurisdiction. Those are the Top 20 regardless of whether they were state, federal, or local responsibility
* Numbers not final

10/22/2021

Figure 6-3: Top 20 Most Destructive California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	**CAMP** *(Powerlines)*	November 2018	Butte	153,336	**18,804**	85
2	**TUBBS** *(Electrical)*	October 2017	Napa & Sonoma	36,807	**5,636**	22
3	**TUNNEL - Oakland Hills** *(Rekindle)*	October 1991	Alameda	1,600	**2,900**	25
4	**CEDAR** *(Human Related)*	October 2003	San Diego	275,246	**2,820**	15
5	**NORTH COMPLEX** *(Lightning)*	August, 2020	Butte, Plumas, & Yuba	318,935	**2,352**	15
6	**VALLEY** *(Electrical)*	September 2015	Lake, Napa & Sonoma	76,067	**1,955**	4
7	**WITCH** *(Powerlines)*	October 2007	San Diego	197,990	**1,650**	2
8	**WOOLSEY** *(Electrical)*	November 2018	Ventura	96,949	**1,643**	3
9	**CARR** *(Human Related)*	July 2018	Shasta County, Trinity	229,651	**1,614**	8
10	**GLASS** *(Undetermined)*	September 2020	Napa & Sonoma	67,484	**1,520**	0
11	**LNU LIGHTNING COMPLEX** *(Lightning/Arson)*	August 2020	Napa, Solano, Sonoma, Yolo, Lake, & Colusa	363,220	**1,491**	6
12	**CZU LIGHTNING COMPLEX** *(Lightning)*	August 2020	Santa Cruz, San Mateo	86,509	**1,490**	1
13	**NUNS** *(Powerline)*	October 2017	Sonoma	54,382	**1,355**	3
14	**DIXIE** *(Under Investigation)**	July 2021	Butte, Plumas, Lassen, & Tehama	963,309	**1,329**	1
15	**THOMAS** *(Powerline)*	December 2017	Ventura & Santa Barbara	281,893	**1,063**	2
16	**CALDOR** *(Under Investigation)*	September 2021	Alpine, Amador, & El Dorado	221,835	**1,003**	1
17	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	**1,003**	6
18	**JONES** *(Undetermined)*	October 1969	Shasta	26,200	**954**	1
19	**AUGUST COMPLEX** *(Lightning)*	August 2020	Mendocino, Humboldt, Trinity, Tehama, Glenn, Lake, & Colusa	1,032,648	**935**	1
20	**BUTTE** *(Powerlines)*	September 2015	Amador & Calaveras	70,868	**921**	2

"Structures" include homes, outbuildings (barns, garages, sheds, etc) and commercial properties destroyed.
This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.
*Numbers not final

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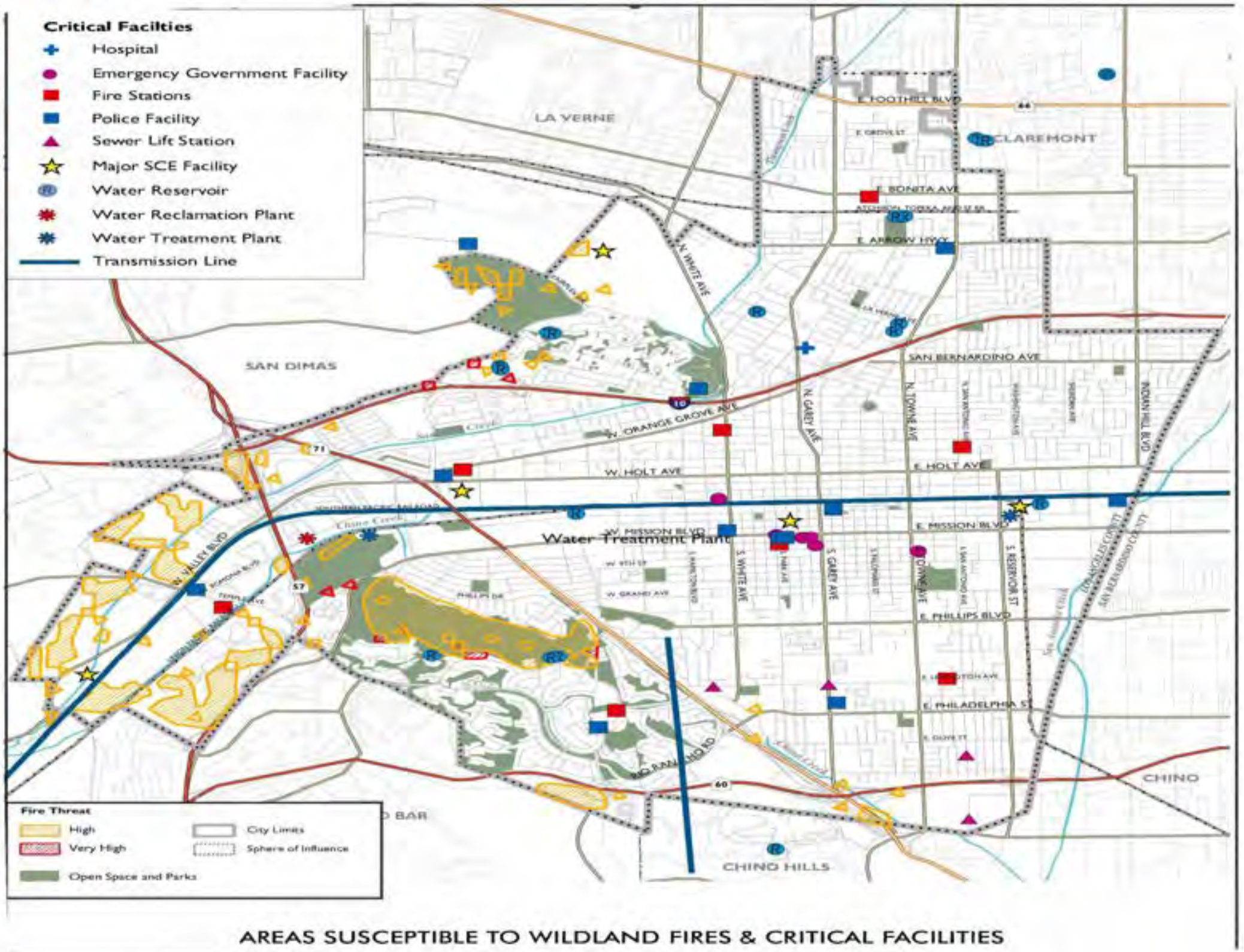
Map 6-1: Areas Susceptible to Wildland Fires



AREAS SUSCEPTIBLE TO WILDLAND FIRES & CRITICAL FACILITIES

7 Flooding

7.1 INTRODUCTION

Flooding has not been a serious hazard to Pomona in several decades, and the risk of disastrous flooding in the City is considered relatively small when compared to the potential for earthquake or wildfire damage to the City. Pomona does not lie within a 100- or 500-year floodplain, as delineated by the Federal Emergency Management Agency (FEMA). Although bisected by several waterways, these creeks have all been channelized, and remain dry except during storm events. However, the potential for a flood event still exists within Pomona, and it is an important hazard to be addressed in the City's LHMP.

7.2 HAZARD PROFILE

HAZARD DESCRIPTION

Flooding hazards are directly related to precipitation (rainfall) intensity and duration. Topography, type and extent of vegetation coverage, area of impermeable surfaces, local slope characteristics, and available drainage facilities all factor into an area's ability to divert precipitation runoff. However, a key element in safely managing runoff volume is the extent of urbanized area. Urbanization increases the volume and velocity of runoff water via two main processes:

- Areas that would normally absorb rainfall (e.g., soils) have been replaced by impermeable surfaces (e.g., streets, houses); and
- The channelization and accumulation of runoff water adds to the collective whole resulting in increased volumes and velocity.

The size, or magnitude, of a flood is described by a term called a "recurrence interval.'' By studying a long period of flow records for a stream, it is possible to estimate the size of a flood that would have a five-year recurrence interval (also called a five-year flood or five-year flood event). A five-year flood is one that would occur, on the average, once every five years (or has 20 percent of occurring during any year). Although a 100-year flood is expected to happen only once in a century, there is a one-percent chance that a flood of that size could happen during any year. The magnitude of flood events could be altered if changes are made to a drainage basin, such as an increase in the amount of impervious (i.e., paved) surfaces.

FEMA, as part of its statutory responsibilities to carry out the National Flood Insurance Program, has mapped most of the flood risk areas within the United States. In fact, most communities with

a one percent chance of a flood occurring in any given year (100-year flood) have a flood way depicted on a Flood Insurance Rate Map (FIRM). However, according to FEMA, Pomona is designated as Flood Zone D, which is an area with "undetermined possible flood hazards". [49]

7.2.1 HISTORIC EVENTS

The history of flooding in Pomona provides an excellent basis to document the effectiveness of existing flood mitigation activities in the City. The flooding hazard is one that has been reduced, through mitigation, from a chronic and damaging natural disaster to a comparatively minor inconvenience to the residents of Pomona.

The City of Pomona is built on the edge of the San Antonio Canyon floodplain, and as a consequence was subjected to regular flooding events throughout its history. Witness reports describe floodwaters to the height of pickup truck beds and floodwaters covering the streets of downtown. In response to a series of particularly disastrous floods in the 1930s, the City developed an extensive network of flood control channels sufficient to provide protection from major flood events (for details on flood channels, refer to the **Section 11.2.4 Existing Flood Mitigation Activities**).[50]

January 1916 Flood

Heavy rainfall during the month of January 1916 resulted in overflowing rivers and streams that devastated much of Southern California. The most significant damage occurred in San Diego County, but San Bernardino, Riverside, Ventura, and Los Angeles Counties were also impacted. Farmlands, dams, bridges, water mains, pipelines, irrigation ditches, wells and pumps, and power plants in these counties were damaged or destroyed. The storms caused the deaths of 22 people in San Diego County, 4 people in Orange County, and 2 people in San Bernardino County. The City of Pomona sustained approximately $15,000 in damage of washes and fills in streets.[51]

March 1938 Flood

A series of almost constant and intense rainfall began during the month of January 1938. By March, much of the terrain in Southern California was already saturated when a slow-moving warm front collided with the Transverse Range resulting in an average of 22.5 inches from February 27 to March 4. The storms resulted in the deaths of 87 people and an estimated $79 million in damage. It was the worst storm on record in nearly 70 years.[52]

January 1969 Flood

Several storms occurred in central and southern California during the months of January and

[49] *https://msc.fema.gov/portal/advanceSearch#searchresultsancho, accessed December 2021*
[50] *Ibid.*
[51] *https://pubs.usgs.gov/wsp/0426/report.pdf, accessed December 2021*
[52] *https://geochange.er.usgs.gov/sw/impacts/hydrology/state_fd/cawater1.html, accessed December 2021*

February resulting in 60 deaths. Approximately $400 million in damage resulted, in large part due to recent home construction in flood prone areas.[53] Peak discharges were 38% to 78% higher than the previous record in March 1938.

The City of Pomona was not alone in improving its flood control measures following the storms that occurred in 1938. The floods that affected the City were widespread and damaging in many cities in the vicinity; regional flood control structures were constructed as part of the Santa Ana River Basin flood protection program, authorized by the Flood Control Acts of 1936 and 1938.[54] These improvements included the San Antonio Dam, which was constructed and is currently located five miles northeast of the City.

Following construction of the flood control measures-which were collectively completed during the late 1950s and 1960s-the City of Pomona witnessed a drastic reduction in flooding hazards. Flooding hazards are now restricted to localized pockets of inundation, primarily in low-lying areas such as underpasses or locations with deficiencies in the storm drainage system. This local flooding occurs on a seasonal basis, depending on the intensity and duration of precipitation during the wet season.

7.2.2 HAZARD LOCATION AND EXTENT

Although Pomona does not lie within a designated floodplain management area, flooding is still a potential hazard to the community. The two types of flooding that could affect the City of Pomona are storm-related flooding and dam inundation.

Although the City has not experienced large-scale storm-related flooding since the construction of flood control infrastructure, localized inundation remains a concern for Pomona residents. Members of the community have indicated that heavy rainfall results in highly localized areas of minor flooding. This assertion is quantified by data provided by the Federal Emergency Management Agency (FEMA). The City has participated in FEMA's National Flood Insurance Program since 1984.[55] Although exact locations of recorded flood damage were unavailable at the time of publication of this plan, known locations with flooding issues include low-lying underpasses and locations with deficiencies in the storm drainage system. While localized flooding does impede traffic flow, the extent of the flooding hazard in Pomona does not overwhelm the City's resources or result in significant adverse impacts.

DAM INUNDATION

The more widespread and serious flooding risk to Pomona is presented by the hazard of dam

[53] *https://pubs.usgs.gov/wsp/2030/report.pdf, accessed December 2021*
[54] *U.S. Army Corps of Engineers, Los Angeles District Reservoir Regulation Section website. http://www.spl.usace.army.mil/resreg/htdocs/snto.html, accessed October 2021*
[55] *Federal Emergency Management Agency. National Flood Program; website: http://www.fema.gov/nfip/104003 I 2.shtm#06, accessed November 4, 2021. Refers to claims processed through December 31, 2020.*

inundation. There are four impoundments in the vicinity of Pomona, two of which have the potential to flood the City in the event of dam failure. Although this hazard would have the potential to cause greater injury and property damage than the storm-related flood events, the likelihood of occurrence is vastly lower.

San Antonio Dam

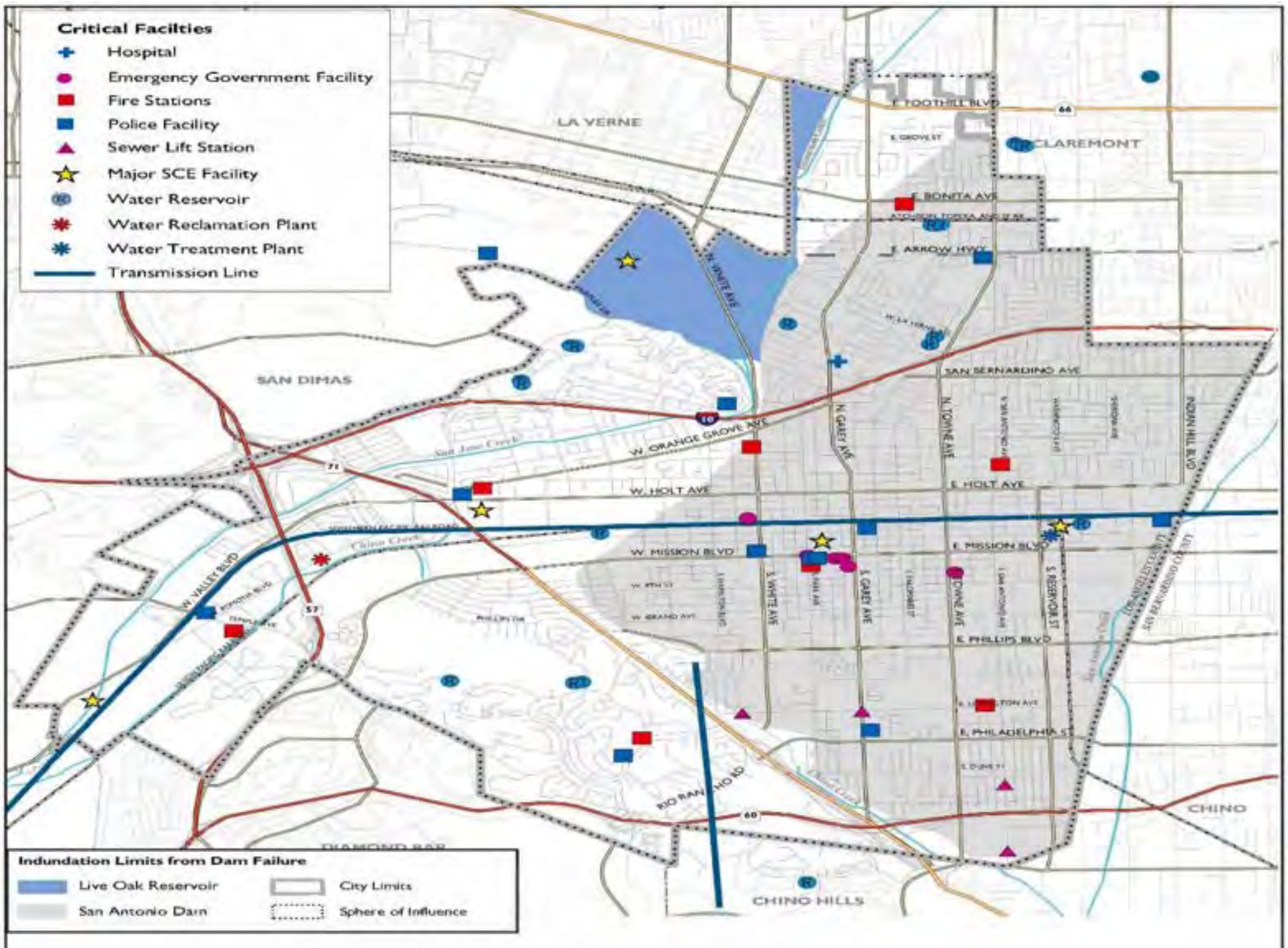
The San Antonio Dam, completed in 1956, is located approximately five miles northeast of the City. The dam is operated by the United States Army Corps of Engineers (USACE). This dam serves primarily as a major flood control structure and therefore does not store large quantities of water except during periods of heavy rain. However, the reservoir has a capacity of 9,350 acre-feet of water and, when full, failure or rupture of the San Antonio Dam would release waters and result in the flooding of areas south of the dam. This area includes large portions of the City, in northern and eastern Pomona. In total, the amount of Pomona at risk to inundation (7,170 acres) equals 48 percent of the City's total land area. The San Antonio Dam inundation boundary is illustrated in **Map 7-1**.

Live Oak Reservoir

The Live Oak Reservoir also poses a flooding threat to Pomona. This reservoir is operated by the Metropolitan Water District of Southern California (MWD) and is utilized for flood control and water conservation purposes. It is located on unincorporated County land between the Cities of La Verne and Claremont, approximately two miles north of Pomona. This reservoir is smaller than the San Antonio Dam and has a maximum capacity of 2,500 acre-feet[56]. In the event of failure of this reservoir, northern portions of the City could be inundated, primarily at the Fairplex. The total amount of land area subject to flooding from this dam is 640 acres, which accounts for four percent of the City. **Map 7-1** illustrates the areas that could be subject to inundation in the event of dam failure.

[56] *City of Pomona Master Environmental Assessment, April 1994, City of Pomona. Materials Recovery Facility Draft Environmental Impact Report. April 1996.*

Map 7-1: Flood Hazards



FLOODING HAZARDS & CRITICAL FACILITIES

FLOOD SEVERITY

The following are ways in which floods may vary in severity:

- Flood volume (the total volume of water in the flood) – this contributes to both the level and duration of flooding. Dams and detention basins are less effective at flood mitigation during large volume floods.
- Rate of rise (how fast the flood rises) – a flood that rises quickly provides less time for warning and evacuation.
- Flow velocity (how fast water is flowing) – faster flow causes a higher risk to human life, a higher risk of erosion, and more damage to infrastructure.
- Flood duration – a flood that lasts for a longer time can have a greater impact due to the increased duration of the disruption to transport, business and personal networks.
- Areal extent – flooding that affects a larger area often has a greater impact.[57]

FLOOD MAGNITUDE

The peak level of water at a particular location in a waterway is called flood magnitude with three classifications:

- Minor – Causes inconvenience such as closing of minor roads and the submergence of low-level bridges.
- Moderate – Inundation in low lying areas requiring removal of livestock and/or evacuation of some houses.
- Major – Inundation of large areas, isolating towns and cities. Major disruptions occur to transportation networks. Evacuation of residents and businesses may be required. In rural areas, widespread flooding of farmland is likely.[58]

7.2.3 PROBABILITY OF FUTURE EVENTS

It is unlikely that the City of Pomona will experience significant storm-related flooding in the future comparable to the scale of floods that took place in its early history. The considerable flood control infrastructure that was developed mid-century has been very effective in preventing large-scale flood events. On the other hand, it is anticipated that localized flooding will continue to occur in the City in the absence of appropriate mitigation measures.

The probability of dam inundation is low. For much of the year, the water levels at these dams are very low or empty. Due to the distance between the reservoirs and Pomona, even in the unlikely event of a dam breach, depending on the water level of the reservoirs, the flood may not

[57] *http://www.chiefscientist.qld.gov.au/floods, accessed January 2022.*
[58] *Ibid.*

even reach City limits.

7.3 VULNERABILITY ASSESSMENT

OVERVIEW

The City of Pomona has a low vulnerability to flood hazards. Current flood control measures effectively prevent the types of damaging floods that were experienced in the 1930s. Current flood issues are restricted to localized street inundation during heavy storm events. With the completion of the I-210 freeway the dam inundation was eliminated.

Although localized flooding occurs seasonally, it has minimal impacts on the City due to its limited location and extent. Dam inundation is also considered to be a low impact hazard. Although it would be far more damaging if it took place, the probability of dam failure is very low due to the engineering standards and safety procedures in place at the dams whose failures would impact the City.

Since the City entered the National Flood Insurance Program (NFIP) in 1984, only 6 total losses have been reported resulting in $42,949 in payments, and no structures have reported repetitive losses.

7.3.1 IDENTIFYING VULNERABILITIES

The City of Pomona is quite resilient to storm-related flooding. Due to the limited scope of the hazard, no structures are considered directly vulnerable to flood damage. The greatest impact caused by storm-related flooding is impediments to the circulation of traffic. Motorists are required to make detours when flooding renders streets impassible. This is typically nothing more than an inconvenience; however, flooding at the underpasses at the Southern Pacific Railroad are a greater vulnerability to Pomona than the other flooding locations.

These major north-south arterials are the only transportation routes that have underpasses constructed beneath the railroad. In the event of a train derailment in the City, it would be crucial for these routes to remain open, as they are the only routes that would not be subjected to closure by a train derailment. North-south circulation in Pomona is crucial to be able to maintain access to the City's only hospital, the Pomona Valley Hospital Medical Center. If the underpasses were flooded during such an event, it would seriously hamper the ability of emergency response vehicles to traverse the City and gain access to the hospital. Although a highly improbable series of events would have to occur in order to result in this scenario, "worst case scenario" analysis is essential to address multi-hazard planning challenges and maximize mitigation effectiveness. For this reason, the underpasses of Garey, White, and Towne Avenues are considered vulnerabilities to the City and are specifically addressed in the multi-hazard action plan items.

With the completion of the I-210 Freeway, the waters from the San Antonio Dam would divert around the city. The freeway is below grade through La Verne, Claremont and Upland which would catch the flow and send the water around Pomona. A new study from the Corps of Engineers and the State is needed to address the new inundation area.

There are relatively few critical facilities and vulnerabilities in the inundation limit of Live Oak Reservoir. The majority of the flooding would occur on grounds currently occupied by the Fairplex. However, approximately 700 residences are located within the inundation area and would require significant emergency evacuation and response in the unlikely event of dam failure. Several neighborhoods in the northwest corner of Pomona are also susceptible to inundation due to dam failure at Thompson Creek.

It is important to emphasize that the risk of widespread, damaging floods from dam inundation is very low. If a dam breach were to occur, the floodwaters would take several hours to reach the City, and the scenario of dam failure In Pomona would be that of a slow-moving, shallow body of water, rather than a catastrophic release of damaging water volumes.

7.3.2 ESTIMATING POTENTIAL LOSSES

Quantifying potential losses due to flooding is a complex process. The primary source of potential flooding damage to the City is dam inundation, a hazard that is highly unlikely to happen. In the event of a dam failure, factors such as the amount of water in the reservoir (both of the reservoirs' water levels fluctuate seasonally), rate of water output, and ability to implement emergency notification procedures would significantly influence the amount of loss sustained by the City.

7.3.3 CLIMATE CHANGE IMPACT

While climate change does not directly cause flooding, climate change can affect the intensity and frequency of precipitation, which in turn increases the potential for flooding. Warmer oceans increase the amount of water that evaporates into the air.[59] When more moisture-laden air moves over land or converges into a storm system, it can produce more intense precipitation—for example, heavier rain and snowstorms. The potential impacts of heavy precipitation include an increase in flood risk due to heavy rains, which in turn can lead to injuries, drownings, and other flooding-related effects on health. In addition, runoff from precipitation can impair water quality as pollutants deposited on land wash into water bodies.

[59] *https://www.epa.gov/climate-indicators/climate-change-indicators-heavy-precipitation, accessed December 2021*

8 Windstorms

8.1 INTRODUCTION

Windstorms have not been a serious hazard in Pomona, and the potential risk of widespread damage from wind is not as considerable as the risk from earthquakes or wildfires. Nevertheless, severe windstorms pose a significant risk to life and property by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause damage to local homes and businesses. Severe windstorms can present a very destabilizing effect on the dry brush that covers local hillsides and urban wildland interface areas and increase wildfire threat. Destructive impacts to trees, power lines, and utility services also are associated with high winds.

8.2 HAZARD PROFILE

HAZARD DESCRIPTION

Santa Ana Winds

Based on local history, most incidents of high wind in the City of Pomona are the result of Santa Ana wind conditions. While high impact wind incidents are not frequent in the area, significant Santa Ana wind events have been known to negatively impact the local community.

Santa Ana winds are blustery, warm – (often hot) – dry winds that blow

Figure 8-1: Santa Ana Winds



from the east or northeast. These occur below the passes and canyons of the coastal ranges of Southern California and in the Los Angeles basin, and typically occur from October to March when cooler air in the desert increase air pressure and creates the westward winds. Generally speaking, winds must reach 25 knots to be classified as a Santa Ana wind.

The map above (**Figure 8-1**) shows the direction of the Santa Ana winds as they travel from the stable, high-pressure weather system called the Great Basin High through the canyons and towards the low-pressure system off the Pacific. Located between Los Angeles and the San Bernardino Mountains, and south of the San Gabriel Mountains, the City of Pomona is in the direct path of the ocean-bound Santa Ana winds.

8.2.1 HISTORIC EVENTS

In 2003 two deaths were caused by fierce Santa Ana wind conditions. A falling tree struck one woman in San Diego, and the second death occurred when a passenger in a vehicle was hit by a flying pickup truck cover launched by Santa Ana winds. In 2011 the cities west of Pomona suffered millions in damage due to downed trees from the winds over a 2-day period. Power was out for over 1 week in some areas.

In Pomona, the City does not track damage due to windstorms. However, reports of dislodged roofs and fallen trees and power lines are common. These are not considered major widespread threats to population and property but do involve responses from emergency service personnel. Fallen power lines have potential for most widespread consequences of power outages and fire. It should be noted that falling trees can occasionally cause fatalities and serious structural damage. These types of incidents are rare in occurrence as well as localized. Due to their limited impacts, none of the risks associated with windstorm are considered high.

8.2.2 HAZARD LOCATION AND EXTENT

Windstorms that affect Pomona, notably Santa Ana winds, are not location specific but rather impact the entire City area. Passes between hillsides are susceptible to slightly higher wind speeds, although the amount of unsheltered development in hillside passes is not substantial. In the case of a Santa Ana wind - which can last several days - hazards created by wind-fallen trees or utility poles can threaten property and have the potential for personal injury and even death. In Pomona, older neighborhoods generally have larger trees. Although these trees are usually large and well-rooted enough to withstand higher speed winds, tree limbs can create significant hazards.

Various scales for estimating the potential damage caused by wind have been developed. The Beaufort Scale developed by Sir Francis Beaufort in 1805 is commonly used and illustrates the effects that varying wind speeds can have on sea swells and structures.

Table 8-1: Beaufort Scale

BEAUFORT FORCE	SPEED (MHP)	WIND DESCRIPTION – EFFECTS ON LAND
0	< 1	Calm - Smoke rises vertically
1	1 – 3	Light - Air Ripples–look like scales - Smoke drift shows direction of wind, but wind vanes do not
2	4–– 7	Light Breeze - Wind vanes move; Leaves rustle; Wind can be felt
3	8 ––12	Gentle Breeze - Leaves and small twigs move constantly; Small, light flags are extended
4	13– 18	Moderate Breeze - Wind lifts dust and loose paper; Small branches move
5	19– 24	Fresh Breeze - Small trees with leaves begin to move
6	25–31	Strong Breeze - Large branches move; Telegraph wires whistle; Hard to hold umbrellas
7	32– 38	Near Gale - Whole trees move; Resistance felt walking into wind
8	39– 46	Gale - Twigs and small branches break off trees; Difficult to walk
10	55– 63	Storm - Trees broken or uprooted; Considerable structural damage
11	64–73	Violent Storm - Seldom experienced inland; Considerable structural damage
12	> 74	Hurricane - Widespread damage. Very rarely experienced on land.

8.2.3 PROBABILITY OF FUTURE EVENTS

Strong Santa Ana winds typically occur on an annual basis; although it is unlikely that Pomona will be subject to widespread damage from windstorm activity, there is potential for isolated events, such as damage to property or communication utilities from the Santa Ana winds which occur frequently during the October to March season. However, it must also be noted that although Santa Ana winds are frequent, the occurrence of a wind with enough velocity to cause significant damage is much less frequent.

8.3 VULNERABILITY ASSESSMENT

OVERVIEW

Based on local history, the probability is low for a damaging windstorm. There have been past occurrences of winds strong enough to create damage to property in Pomona. However, there has not been a recorded instance of a windstorm strong enough to create widespread damage

in Pomona. Damage is usually restricted to isolated roof and tree damage.

Life and Property

Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region that can be adversely impacted during a windstorm event. This can result in the involvement of City emergency response personnel. Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail causing considerable damage.

Debris carried along by extreme winds can directly contribute to loss of life and indirectly to the failure of protective building envelopes, siding, or walls. When severe windstorms strike a community, downed trees, power lines, and damaged property can be major hindrances to emergency response and disaster recovery.

Utilities

Historically, falling trees have been the major cause of power outages in the region. Windstorms can cause flying debris and downed utility lines. For example, tree limbs breaking in winds of only 45 mph can be thrown over 75 feet. As such, overhead power lines can be damaged even in relatively minor windstorm events. Falling trees can bring electric power lines down to the pavement, creating the possibility of electric shock.

Infrastructure

Windstorms can damage buildings, power lines, and other property and infrastructure due to falling trees and branches. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds.

Windstorms can result in collapsed or damaged buildings or blocked roads and bridges, damaged traffic signals, streetlights, and parks, among others. Roads blocked by fallen trees during a windstorm may have severe consequences to people who need access to emergency services. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric services and from extended road closures. They can also sustain direct losses to buildings, personnel, and other vital equipment. There are direct consequences to the local economy resulting from windstorms related to both physical damages and interrupted services.

Increased Fire Threat

Perhaps the greatest danger from windstorm activity in Southern California comes from the combination of the Santa Ana winds with the major fires that occur regularly in the

urban/wildland interface. With the Santa Ana winds driving the flames, the speed and reach of the flames is even greater than in times of calm wind conditions. The higher fire hazard raised by a Santa Ana wind condition requires that even more care and attention be paid to proper brush clearances on property in the wildland/urban interface areas.

Transportation

Windstorm activity can have an impact on local transportation in addition to the problems caused by downed trees and electrical wires blocking streets and highways. During periods of extremely strong Santa Ana winds, major highways can be temporarily closed to truck and vehicular traffic. However, typically these disruptions are not long lasting, nor do they carry a severe long-term economic impact on the region.

8.3.1 IDENTIFYING VULNERABILITIES

The City of Pomona is not prone to widespread damage from wind and there are no critical facilities and vulnerabilities considered at high risk from windstorms.

8.3.2 ESTIMATING POTENTIAL LOSSES

Potential losses from windstorms are expected to be primarily limited to isolated impacts to property such as roof or tree damage. There are no areas of specific risk in Pomona; losses are not expected to be significant to the City.

8.3.3 CLIMATE CHANGE IMPACT

Climate change is contributing to more severe weather events, including unusually hot and cold temperatures, which in turn impact the pressure systems which create wind events and the severity of windstorm events.

9 Pandemic/Infectious Disease

9.1 INTRODUCTION

This LHMP is being prepared in 2021, during a worldwide pandemic created by the COVID-19 virus. As of December 20, 2021, there have been approximately 51.05 million cases and 807,732 deaths in the United States alone attributed to the virus, which has sparked nationwide stay-at-home orders, shuttered schools, caused severe economic distress, stressed the medical system, and taken a toll on the nation's physical, psychological, and economic well-being. More about the current pandemic is covered further below in this report.

9.2 HAZARD PROFILE

Pandemics are defined as large-scale outbreaks of infectious disease for which there is little or no human immunity. Pandemics cause disease and death over a wide geographic area and cause significant economic disruption.

The California Department of Public Health (CDPH) and Los Angeles County Department of Public Health have identified seasonal influenza and viral disease pandemics as specific hazards that would have a significant impact throughout the entire City of Pomona.

9.2.1 HISTORIC EVENTS

There have been five worldwide pandemics over the past 102 years:

1918 "Spanish Flu" (H1N1 Virus)



The 1918-1919 Spanish Flu was estimated to have sickened 20%-40% of the world's population. Over 20 million people lost their lives. Between September 1918 and April 1919, 500,000 Americans died. The flu spread rapidly; many died within a few days of infection; others from secondary complications. The attack rate and mortality were highest among adults 20-50 years old; the reasons for this are uncertain. By late September 1918, over 35,000 people throughout California had contracted the Spanish Flu. According to state officials, influenza was most prevalent in the southern part of California, but the death toll was high across the state.

1957-1958 "Asian Flu" (H2N2 Virus)

This virus was quickly identified due to advances in technology, and a vaccine was produced. Infection rates were highest among school children, young adults, and pregnant women. The elderly had the highest rates of death. A second wave was developed in 1958 and in total, there were about 70,000 deaths in the United States. Worldwide deaths were estimated between roughly 1 and 2 million.

1968-1969 "Hong Kong Flu" (H3N2 Virus)
The strain of the H3N2 Hong Kong Flu caused approximately 34,000 deaths in the United States and more than 700,000 deaths globally. It was first detected in Hong Kon g in early 1968 and spread to the United States later that year. Those over the age of 65 were most likely to die. This virus returned in 1970 and 1972 and still circulates today.

2009 H1N1 Influenza Virus
The first influenza pandemic of the 21st century occurred in 2009–2010 and was caused by an influenza A (H1N1) virus. It was the first pandemic for which many member States had developed comprehensive pandemic plans describing the public health measures to be taken, aimed at reducing illness and fatalities. For the first time, pandemic vaccinations were developed, produced, and deployed in multiple countries during its first year.

While most cases of pandemic H1N1 were mild, globally it is estimated that the 2009 pandemic caused between 100,000–400,000 deaths in the first year alone. Children and young adults were disproportionately affected in comparison to seasonal influenza, which causes severe disease mainly in the elderly, persons with chronic conditions, and pregnant women.

2019-2021 (Ongoing) Covid-19 Coronavirus (SARS-CoV-2)
The world is currently facing a global viral pandemic caused by a novel coronavirus disease, SARS-CoV-2. Coronaviruses are a large family of viruses that usually cause mild respiratory disease, such as the common cold, but can also cause more serious illness. The virus that causes the Covid-19 is passed from person to person through respiratory secretions, such as saliva or discharge from the nose when one coughs or sneezes. Experts currently researching the virus believe that the virus can also be spread when airborne through aerosols.

The severity of Covid-19 symptoms ranges from mild to severe and affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization. Some of the most common symptoms include fever, dry cough, and fatigue. Less common symptoms include aches and pains, nasal congestion, sore throat, diarrhea, conjunctivitis, headache, loss of taste or smell, a rash on skin, or discoloration of fingers or toes. The most serious symptoms include difficulty breathing or shortness of breath, chest pain or pressure, or loss of speech or movement.

9.2.2 PANDEMIC/INFECTIOUS DISEASE LOCATION AND EXTENT

Pandemic/Infectious Diseases are not location specific but rather impact the entire City and/or regional areas. In March of 2020, the World Health Organization characterized the outbreak as a pandemic, the United States declared the novel coronavirus a national emergency, Los Angeles County declared a local state of emergency.

According to Johns Hopkins University Coronavirus Resource Center, as of December 20, 2021, there have been roughly 275.3 million confirmed cases globally, 5.36 million global deaths, 51.05 million confirmed cases in the United States, and 807,732 US deaths. According to the California Department of Public Health, as of December 20, 2021, there have been 4,935,461 confirmed cases in California and 75,167 deaths, with 1,495,082 confirmed cases in Los Angeles County and 27,441 confirmed deaths. According to the Los Angeles County Department of Public Health, there have been 30,763 confirmed cases and 513 deaths in the City of Pomona to date.

At the time that this is being written, a nationwide and worldwide vaccine and booster campaign is currently underway, with vaccines approved in the United States for individuals age 12 and older. As of December 20, 2021, approximately 8,713,305,104 vaccine doses have been administered worldwide, 496,239,573 doses have been administered in the United States, 62,762,797 have been administered in California and approximately 6,835,658 people have been fully vaccinated in Los Angeles County. At the same time, variants of the disease are spreading, and public health officials are continually monitoring these developments.

Pomona, as well as other cities and regions across the world, faced or are facing high levels of illness, mortality, social disruption, political instability, mass unemployment, and economic losses. Recent impacts range from school and business closings to the interruption of basic essential services such as public transportation, health care/first aid, and the delivery of food and essential medicines to those in need.

The extent of a pandemic or infectious disease outbreak can be measured using **Table 9-1** below.

Table 9-1: Level of Community Transmission

LEVEL OF COMMUNITY TRANSMISSION	COMMUNITY CHARACTERISTICS & DESCRIPTION
Substantial, uncontrolled transmission	Large scale, uncontrolled community transmission, including communal settings (e.g., schools, workplaces)
Substantial, controlled transmission	Large scale, controlled transmission, including communal settings (e.g., schools, workplaces)
Minimal to moderate community transmission	Sustained transmission with high likelihood or confirmed exposure within communal settings and potential for rapid increase in cases

No to minimal community transmission	Evidence of isolated cases or limited community transmission, case investigations underway; no evidence of exposure in large communal settings

9.2.3 PROBABILITY OF FUTURE OCCURRENCE

Evidence suggests that the likelihood of pandemics has increased over the past 100 years because of increased global travel and integration, urbanization, changes in land use, and greater exploitation of the natural environment. These trends likely will continue and will intensify.

The precise timing of a pandemic-scale health-related emergency is uncertain. Pandemic occurrences are most likely when a virus makes a dramatic change, or antigenic shift, that results in a new or "novel" virus to which the population has no immunity. Epidemic occurrences are more likely when there are ecological changes, the pathogen mutates, or the pathogen is introduced into an unprepared host population.

According to the World Bank, increased exposure to wildlife increases the risk to health, biosafety and global security. The current SARS-CoV-2 originated in wildlife; the virus managed to break the species barrier into humans, a phenomenon called zoonosis. Numerous other emerging vector-borne diseases also originated in wildlife and were transmitted to humans.

9.3 VULNERABILITY ASSESSMENT

9.3.1 IDENTIFYING VULNERABILITIES

While the entire population of the planning area may be at risk of infectious diseases and pandemics, some portions of the population may be at greater risk, including the very young, the elderly, and immune-compromised individuals. The recent COVID-19 pandemic also illustrated a greater risk for portions of the population living in areas of concentrated pollution and poverty, who may have greater risk of comorbidity factors that can influence immune response, may not have adequate access to shelter, transportation, healthy foods, and health care, and may not have the opportunity to work from home, or to take time off from work if they become ill.

Critical facilities, the natural environment, and structures would not be impacted by an infectious disease outbreak or pandemic. The most vulnerable aspects of the community are loss of life and potentially long-term health impacts, impacts to essential public services due to closure or limited operating hours of facilities, and the economy, which can suffer great losses if businesses are not able to operate at full capacity. The areas of the economy that are most vulnerable are service oriented, recreation and entertainment, and tourist sectors.

9.3.2 ESTIMATING POTENTIAL LOSSES

There is no way to adequately predict the loss of life, impacts to essential public services, or the economy as a result of an infectious disease outbreak or pandemic, particularly in the case of an emerging infectious disease (EID) or novel virus, where no vaccine exists, little is known about how the disease is spread, the virulence of the disease and how quickly it spreads, how to treat it, and who is at greatest risk.

9.3.3 CLIMATE CHANGE IMPACT

Researchers are studying the impacts of climate change on infectious disease. Loss of biodiversity, destruction of wildlands, and warming temperatures may all be contributing to the spread of infectious disease.

According to the CDC, climate change, together with other natural and human-made health stressors, influences human health and disease in numerous ways. Some existing health threats will intensify, and new health threats will emerge. In the U.S., public health can be affected by disruptions of physical, biological, and ecological systems, including disturbances originating here and elsewhere. The health effects of these disruptions include increased respiratory and cardiovascular disease, injuries and premature deaths related to extreme weather events, changes in the prevalence and geographical distribution of food- and water-borne illnesses and other infectious diseases, and threats to mental health.

According to the World Health Organization, climatic conditions strongly affect water-borne diseases and diseases transmitted through insects, snails, or other cold-blooded animals. Changes in climate are likely to lengthen the transmission seasons of important vector-borne diseases and to alter their geographic range. Malaria is strongly influenced by climate. Transmitted by Anopheles mosquitoes, malaria kills over 400,000 people every year – mainly children under 5 years old in certain African countries. The Aedes mosquito vector of dengue is also highly sensitive to climate conditions, and studies suggest that climate change is likely to continue to increase exposure to dengue.

While developing nations are more vulnerable to many of these diseases than the United States or the City of Pomona, all populations will be affected by climate change.

10 Goals and Objectives

10.1 INTRODUCTION

One of the steps in preparing the *Local Hazard Mitigation Plan* pursuant to the Disaster Management Act of 2000 is consideration of the City's mission in hazard planning and related goals and objectives. The mission establishes the overarching guiding principle, whereas goals are broad statements of intent and objectives provide direction on actions to achieve the goal. The mission, goals, and objectives were based on the hazard and risk analysis along with input from the Technical Advisory Committee (TAC) and community members.

10.2 MISSION STATEMENT

The City of Pomona's mission for the LHMP is to:

> *Establish a comprehensive strategy of programs, development regulations, and cost-effective improvement projects to protect citizens, critical facilities, infrastructure, private property, and the environment from local hazards.*

The goals and objectives specified below together serve as the framework for formulating the LHMP mitigation strategy, thereby linking the mission statement to the action plan.

10.3 GOALS AND OBJECTIVES FRAMEWORK

PROTECT LIFE AND PROPERTY

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses.
  - *Objective 1.1.1:* Increase the resilience of institutions, services, and lifeline systems that are essential to Pomona' s functioning.
  - *Objective 1.1.2:* Increase the ability of the City government to serve the community during and after events through response, recovery, and rebuilding.
  - *Objective 1.1.3:* Recognize the potential for greater impacts to vulnerable populations and overcrowded neighborhoods in emergency response and mitigation planning.
  - *Objective 1.1.4:* Continue to utilize the emergency management system to provide

early warning of and response to all life-threatening hazards that can be predicted, such as earthquakes, floods, landslides, severe storms, wildfires, and hazardous materials incidents.

- ***Goal 1.2****:* Protect Pomona's unique character and values from being compromised by hazard events.
  - *Objective 1.2.1:* Encourage and support the long-term protection of historic and architecturally significant structures to preserve neighborhood and community character.
  - *Objective 1.2.2:* Implement mitigation that effectively addresses the hazard potential while preserving unique historical values.
  - *Objective 1.2.3:* Support the long-term protection of Pomona's neighborhoods by reducing the potential impact to structures from hazard events.

- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development.
  - *Objective 1.3.1:* Coordinate land use plans and regulations to direct development away, or buffer development from, area and site-specific hazards.
  - *Objective 1.3.2:* Continue maintenance programs, such as site inspection and trash/debris removal, to reduce the potential for wildfire and other problems.
  - *Objective 1.3.3:* Encourage insurance coverage for earthquake events.
  - *Objective 1.3.4:* Ensure that new buildings and substantial improvements to existing buildings are governed by and incorporate all appropriate building codes and construction measures to protect them against failure of damage.
  - *Objective 1.3.5:* Implement a program to mitigate the hazards posed by older unreinforced masonry buildings largely clustered in the downtown area.
  - *Objective 1.3.6:* Avoid localized hazards and associated risks to property and people by implementing appropriate improvements, such as construction of stormwater drainage improvements for localized flooding and slope stabilization measures for localized landslide conditions.
  - *Objective 1.3.7:* Avoid localized flooding problems by construction of appropriate storm water drainage improvements.

PUBLIC AWARENESS

- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards.
  - *Objective 2.1.1:* Prioritize community education and outreach in hazard mitigation planning.

- *Objective 2.1.2:* Develop targeted education and outreach programs to segments of the community that are most at-risk to hazards events.
- *Objective 2.1.3:* Encourage the distribution of information to residents, businesses, and public employees on safety and health precautions to take in advance of and during a disaster.
- *Objective 2.1.4:* Utilize local organizations and community partners in preparedness training and post-disaster assistance.
- *Objective 2.1.5:* Advise and assist residents and businesses in taking appropriate mitigation steps to protect their properties.
- *Objective 2.1.6:* Aid both the private and public sectors in understanding the risks they may be exposed to and finding mitigation strategies to reduce those risks.

NATURAL SYSTEMS

- ***Goal 3.1****:* Balance natural resource management and land use planning with local hazard mitigation to protect life, property, and the environment.
  - *Objective 3.1.l:* Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions where possible, recognizing the built-out character of the City.
  - *Objective 3.1.2:* Minimize potential negative environmental impacts from mitigation efforts.

PARTNERSHIPS AND IMPLEMENTATION

- ***Goal 4.1****:* Encourage and support leadership within Pomona to promote and implement local hazard mitigation activities.
  - *Objective 4.1.1:* Strengthen communication and coordination with public agencies, citizens, non-profit organizations, business, and industry to ensure support for implementation.
  - *Objective 4.1.2:* Provide information on tools, partnership opportunities, and funding resources to assist in implementing mitigation activities.
  - *Objective 4.1.3:* Continue developing and strengthening interjurisdictional coordination and cooperation in the area of emergency services and post-disaster response programs.
  - *Objective 4.1.4:* Maintain partnerships with facilities and institutions with populations that are particularly vulnerable to risks associated with local hazards, including emergency planning and post-disaster contingency plans.
  - *Objective 4.1.5:* Coordinate with utility and transportation providers to establish and maintain early warning systems.
  - *Objective 4.1.6:* Periodically review and update the Local Hazards Mitigation Plan, taking into consideration new hazards in formation, changes in vulnerabilities and critical facilities, and advancements in emergency response and post-disaster

services.

EMERGENCY SERVICES

- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events.
  - *Objective 5.1.1:* Prioritize funding and implementation schedules for improvements needed to ensure continuous and extensive emergency response capabilities.
  - *Objective 5.1.2:* Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.
  - *Objective 5.1.3:* Coordinate and integrate local hazard mitigation activities, where appropriate, with emergency operations plans and procedures.
  - *Objective 5.1.4:* Continue providing emergency services with training and equipment to address all identified hazards.
  - *Objective 5.1.5:* Distribute resources for emergency response around the City to ensure accessibility.
  - *Objective 5.1.6:* Conduct periodic emergency preparedness drills involving City staff and emergency services, other emergency service providers, critical facilities, utility operators, community partners, and institutions with vulnerable populations.

11 Mitigation Action Plan

11.1 INTRODUCTION

Risks associated with natural hazards in Pomona are reduced through a variety of programs implemented by federal, state, and local agencies and governments, including the City of Pomona. This chapter sets forth the mitigation action plan that the City is committed to implementing to reduce the potential for risks in the event of earthquake, landslide, wildfire, flooding, windstorm, or pandemic/infectious disease, and to maximize the effectiveness of the emergency response system to avoid injury, life loss, and property damage.

The mitigation actions represent the culmination of the research, mapping, analysis, and community outreach conducted for the LHMP. More specifically, the mitigation considers:

- Risks associated with critical facilities and community vulnerabilities that have been prioritized and ranked using a FEMA approved method;
- LHMP mission, goals and objectives as outlined in **Chapter 10**; and
- Input from City staff and stakeholders and additional research conducted by the project team.

In the process of formulating the mitigation action plan, the Technical Advisory Committee reviewed a series of draft mitigation measures and provided feedback on cost-effectiveness, political will, technical feasibility, and environmental soundness. During this process the TAC helped to identify additional mitigation as well as improve the feasibility and effectiveness of the proposed mitigation given Pomona's unique needs.

For each mitigation action, the following are documented:

- Local hazards addressed;
- Goals and objectives implemented - it should be noted that many of the mitigation actions are designed to achieve multiple goals and objectives;
- FEMA ranking
- Lead department responsible;
- Funding source; and
- Implementation schedule. Mitigation actions currently underway are noted as appropriate. The City will continue to seek assistance through federal, state, and regional funding programs.

RANKING

The Mitigation Action Items were ranked using an approved FEMA method based upon the

following levels:

- *Level 1* - Requires human resources, but not necessarily financial resources
- *Level 2* - Can be accomplished primarily by City staff, but requires financial resources, internal or external
- *Level 3* - Requires external expertise/consultant and financial resources, internal or external
- *Level 4* - Requires multiple entity/agency participation, environmental reviews, and external human and financial resources.

COST-EFFECTIVENESS ANALYSIS FOR MITIGATION

Cost effectiveness analysis is an important tool that the City will use to help prioritize mitigation actions. This process will assist in identifying those actions that maximize risk reduction with efficient expenditure of public funds. Appendix D contains the guidelines for cost effectiveness analysis that the City will follow.

MITIGATION STRATEGY

Pomona uses various City Codes, State Building Codes, State Fire Codes and zoning to promote the best practices in mitigation for the community. The City has already seen that these strategies have had a dramatic reduction in the risk of flooding and wildfire to the community. The City has also seen that a review of building codes after an event and implementing new policies and codes has also reduced the risk to the community for landslides. Recent interest in improving the downtown area has had a significate impact in reducing and mitigating hazards in older historical buildings that populate the downtown area.

The City has designated the Safety & Emergency Management Officer as the Hazard Mitigation Coordinator and a Technical Advisory Committee to steer LHMP implementation. The Coordinator will be responsible for:

- Overseeing implementation of the LHMP.
- Preparing an Annual Report to the City Council in coordination with the Technical Advisory Committee that details mitigation action items to implement in the upcoming year, including cost estimates, cost/benefit or cost-effectiveness analyses (see Appendix D), and recommendations for items to include in the City's Capital Improvement Program.
- Updating the LHMP every five years in coordination with the Technical Advisory Committee by evaluating the cost effectiveness of mitigation implementation, addressing changes in critical facilities and vulnerabilities, incorporating advancements in emergency response and post disaster services, and updating hazard and risk assessments as new information becomes available. This includes incorporating new data from federal, state, or regional hazard mapping and delineation efforts.
- Establishing and maintaining the roster for the Technical Advisory Committee, calling

meetings, and preparing agendas and necessary information materials for meetings.

The Technical Advisory Committee will be comprised of representatives of City departments involved in LHMP implementation, representatives of critical and vulnerable facilities, and community stakeholders involved in emergency preparedness and response. In addition to the roles in the Annual Report and LHMP Five-Year Updates noted above, the Technical Advisory Committee will provide input on community education efforts.

ORGANIZATION OF MITIGATION ACTION ITEMS
The Mitigation Action Items listed in **Section 11.3** are organized by the following purpose categories:

- LHMP Implementation Structure
- Ready Critical Facilities and Emergency Services
- Community Preparedness and Education
- Resilient Housing, Neighborhoods and Commercial Districts
- Risk Reduction for Community Vulnerabilities
- Development Planning and Regulatory Framework
- City Emergency Operation Plan (EOP) and Standardized Emergency Management Systems (SEMS) Planning and Training

11.2 EXISTING MITIGATION ACTIVITIES

11.2.1 EXISTING EARTHQUAKE MITIGATION ACTIVITIES

Existing mitigation activities include current mitigation programs and activities that are being implemented by various levels of government, as well as private and educational organizations.

CITY OF POMONA CODES
Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Pomona Department of Building and Safety enforces building codes pertaining to earthquake hazards. Currently, the City of Pomona uses the California Building Code (CBC) of 2019 as its standard for minimum design and construction standards of new buildings. This most recent code was adopted in 2020 and included the adoption of updated seismic safety standards.

The City of Pomona Planning Department enforces the zoning and land use regulations relating to earthquake hazards. The policy of the City is to reduce unacceptable levels of seismic risk by controlling land use and building design in known fault zones and upon soils that may fail under seismic activity. This policy does not directly regulate specific land uses but leaves final approval of projects to the proper decision-making body, based on information from recommended

geologic studies, and environmental impact reports, when required.

CALIFORNIA EARTHQUAKE MITIGATION LEGISLATION

Threats resulting from earthquakes have been well documented in California. Dating back to the 19th century, Californians have been killed, injured, and lost property as a result of earthquakes. As the State's population continues to grow, and urban areas become even more densely built up, the risk will continue to increase. For decades the Legislature has passed laws to strengthen the built environment and protect the citizens. **Table 11-1** provides a sampling of some of the 200 plus laws in the State's codes.

Hospitals

The Alfred E. Alquist Hospital Seismic Safety Act (Hospital Act) was enacted in 1973 in response to the magnitude 6.6 Sylmar Earthquake in 1971, when four major hospital campuses were severely damaged and evacuated. Two hospital buildings collapsed killing 47 people. Three others were killed in another hospital that nearly collapsed.

In approving the Act, the Legislature noted that:

> *"Hospitals, that house patients who have less than the capacity of normally healthy persons to protect themselves, and that must be reasonably capable of providing services to the public after a disaster, shall be designed and constructed to resist, insofar as practical, the forces generated by earthquakes, gravity and winds (Health and Safety Code Section 1 29680)."*

When the Hospital Act was passed in 1973, the State anticipated that, based on the regular and timely replacement of aging hospital facilities, the majority of hospital buildings would be in compliance with the Act's standards within 25 years. However, hospital buildings were not, and are not, being replaced at that anticipated rate. In fact, the great majority of the States urgent care facilities are now more than 40 years old.

Table 11-1: Partial List of California Laws on Earthquake Safety

CODE SECTION	DESCRIPTION
Government Code Section 8870- 8870.95:	Creates Seismic Safety Commission.
Government Code Section 8876.1 - 8776.10:	Established the California Center for Earthquake Engineering Research.
Public Resources Code Section 2800 - 2804.6:	Authorized a prototype earthquake prediction system along the central San Andreas fault near the City of Parkfield.
Public Resources Code Section 2810 – 2815:	Continued the Southern California Earthquake Preparedness Project and the Bay Area Regional Earthquake Preparedness Project.
Health and Safety Code Section 16100 –	The Seismic Safety Commission and State

16110:	Architect will develop a state policy on acceptable levels of earthquake risk for new and existing state-owned buildings.
Government Code Section 8871- 8871.5:	Established the California Earthquake Hazards Reduction Act of 1986.
Health and Safety Code Section 130000-130025:	Defined earthquake performance standards for hospitals.
Public Resources Code Section 2805 – 2808:	Established the California Earthquake Education Project.
Government Code Section 8899.10 - 8899.16:	Established the Earthquake Research Evaluation Conference.
Public Resources Code Section 2621 – 2630 2621:	Established the Alquist-Priolo Earthquake Fault Zoning Act.
Government Code Section Public 8878.50 - 8878.52 8878.50:	Created the Earthquake Safety and Public Buildings Rehabilitation Bond Act of 1990.
Education Code Section 35295 - 35297 35295:	Established emergency procedure systems in kindergarten through grade 12 in all the public or private schools.
Health and Safety Code Section 19160-19169:	Established standards for seismic retrofitting of unreinforced masonry building.
Health and Safety Code Section 1596.80-1596.879:	Required all child day care facilities to include an Earthquake Preparedness Checklist as an attachment to their disaster plan.

The magnitude 6.7 Northridge Earthquake in 1994 caused $3 billion in hospital-related damage and evacuations. Twelve hospital buildings constructed before the Act were cited (red tagged) as unsafe for occupancy after the earthquake. Those hospitals that had been built in accordance with the 1973 Hospital Act were very successful in resisting structural damage. However, nonstructural damage (for example, plumbing and ceiling systems) was still extensive in those post-1973 buildings.

Senate Bill 1953 ("SB 1953"), enacted in 1994 after the Northridge Earthquake, expanded the scope of the 1973 Hospital Act. Under SB 1953, all hospitals are required, as of January 1, 2 008, to survive earthquakes without collapsing or posing the threat of significant loss of life. The 1994 Act further mandates that all existing hospitals be seismically evaluated, and retrofitted, if needed, by 2030, so that they are in substantial compliance with the Act (which requires that the hospital buildings be reasonably capable of providing services to the public after disasters). SB 1953 applies to all urgent care facilities (including those built prior to the 1973 Hospital Act) and affects approximately 2,500 buildings on 475 campuses.

BUSINESSES/PRIVATE SECTOR

Natural hazards have a devastating impact on businesses. In fact, of all businesses which close following a disaster, more than forty-three percent never reopen, and an additional twenty-nine percent close for good within the next two years[60]. The Institute of Business and Home Safety has developed "Open for Business ", which is a disaster planning toolkit to help guide businesses in preparing for and dealing with the adverse effects of natural hazards. The kit integrates protection from natural disasters into the company's risk reduction measures to safeguard employees, customers, and the investment itself. The guide helps businesses secure human and physical resources during disasters and helps to develop strategies to maintain business continuity before, during, and after a disaster occurs.

EARTHQUAKE EDUCATION

Earthquake research and education activities are conducted at several major universities in the Southern California region, including Cal Tech, USC, UCLA, UCI, and UCSB. The local clearing house for earthquake information is the Southern California Earthquake Center (SCEC), located at the University of Southern California, Los Angeles, CA 90089, Telephone: (213) 740-5843, Fax: (213) 740-0011, Email: SCEinfo@usc.edu Website: http://www.scec.org. The SCEC is a community of scientists and specialists who actively coordinate research on earthquake hazards at nine core institutions and communicate earthquake information to the public. The SCEC is a National Science Foundation (NSF) Science and Technology Center and is co-funded by the United States Geological Survey (USGS).

In addition, Los Angeles County along with other Southern California counties sponsors the Emergency Survival Program (ESP), an educational program for learning how to prepare for earthquakes and other disasters. Many school districts have very active emergency preparedness programs that include earthquake drills and periodic disaster response team exercises.

Proposed Earthquake Mitigation Action Items

The earthquake mitigation action items provide guidance on suggesting specific activities that agencies, organizations, and residents in the City of Pomona can undertake to reduce risk and prevent loss from earthquake events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation. The City of Pomona proposes the following earthquake mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 2.3: Reinforcement of Other City Facilities
- Mitigation Action 2.5: Aging Water and Sewer Infrastructure Replacement

[60] *Institute for Business and Home Safety Resources. August 2021.*

- Mitigation Action 4.1: Unreinforced Masonry Buildings
- Mitigation Action 4.2: Vulnerable Building Reinforcement
- Mitigation Action 4.3: Valuing Heritage
- Mitigation Action 4.5: Expanded Code Enforcement in Overcrowded Neighborhoods

11.2.2 EXISTING LANDSLIDE MITIGATION ACTIVIES

LANDSLIDE BUILDING AND ZONING CODES

The City of Pomona Development Code addresses development on steep slopes in subsection 580I0 concerning development for hillside properties. These sections outline standards for areas with median slopes of 10 percent or more before grading. Generally, the ordinance requires larger lot sizes based on slope percentage, as is indicated in **Table 11-2.** The ordinance also allows for building design to accommodate the site, landscaping to protect against erosion, drainage, and controls for excavations and grading. The Hillside provisions also allow for a Hillside Advisory Review Committee to review development plans in hillside areas.

Table 11-2: Minimum Lot Sizes in Residential Hillside Areas

GRADE OF SLOPE (PERCENT)	MINIMUM LOT SIZE (SQ. FT.)
0 - 10	7,200
10 - 30	10,000
30 - 40	20,000
40 or more	1 acre
Source: City of Pomona Zoning Ordinance, 1971-1972; revised 2010	

Proposed Landslide Mitigation Action Items

The City of Pomona proposes the following landslide mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 4.6: Landslide Prevention
- Mitigation Action 4.7: Landslide Prevention Development Standards

11.2.3 EXISTING WILDFIRE MITIGATION ACTIVITIES

Existing mitigation activities include current mitigation programs and activities that are being implemented by county, regional, state, or federal agencies or organizations.

LOCAL PROGRAMS

In Southern California there are dozens of independent local fire departments as well as large county wide consolidated fire districts. Although each district or department is responsible for fire related issues in specific geographic areas, they work together to keep Southern California residents safe from fire. Although fire agencies work together to fight urban/wildland interface fires, each separate agency may have a somewhat different set of codes to enforce for mitigation activities.

In Pomona, fire protection is provided by the Los Angeles County Fire Department. The Fire Department not only provides response to fire emergencies, but also provides fire prevention, brush clearance, and education programs.

FIRE CODES

Developments within high fire threat are subject to the City of Pomona Zoning Ordinance and the California Building Code. These codes require buildings to incorporate fire resistant materials, maintain setbacks between buildings, and maintain landscaping and clear fire hazard brush. Both the Zoning Ordinance and the Building Code are subject to regular updates.

FEDERAL PROGRAMS

Federal Emergency Management Agency (FEMA) Programs

FEMA is directly responsible for providing fire suppression assistance grants and, in certain cases, major disaster assistance and hazard mitigation grants in response to fires. The role of FEMA in the wildland/urban interface is to encourage comprehensive disaster preparedness plans and programs, increase the capability of state and local governments, and provide for a greater understanding of FEMA programs at the federal, state and local levels.[61]

Fire Suppression Assistance Grants

Fire Suppression Assistance Grants may be provided to a state with an approved hazard mitigation plan for the suppression of a forest or grassland fire that threatens to become a major disaster on public or private lands. These grants are provided to protect life and improved property and encourage the development and implementation of viable multi-hazard mitigation measures and provide training to clarify FEMA's programs. The grant may include funds for equipment, supplies and personnel. A Fire Suppression Assistance Grant is the form of assistance most often provided by FEMA to a state for a fire. The grants are cost-shared with states. FEMA's US Fire Administration (USFA) provides public education materials addressing wildland/urban interface issues and the USFA's National Fire Academy provides training programs.

[61] *Source: National Interagency Fire Center. Boise ID and California Division of Forestry, Riverside Fire Lab.*

National Wildland/Urban Interface Fire Protection Program

Federal agencies can use the National Wildland/Urban Interface Fire Protection Program to focus on wildland/urban interface fire protection issues and actions. The Western Governors' Association (WGA) can act as a catalyst to involve state agencies, as well as local and private stakeholders, with the objective of developing an implementation plan to achieve a uniform, integrated national approach to hazard and risk assessment and fire prevention and protection in the wildland/urban interface. The program helps states develop viable and comprehensive wildland fire mitigation plans and performance-based partnerships.

Proposed Wildfire Mitigation Action Items

The City of Pomona proposes the following wildfire mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 2.3: Reinforcement of Other City Facilities
- Mitigation Action 2.5: Aging Water and Sewer Infrastructure Replacement
- Mitigation Action 4.4: Reduced Wildfire Threat

11.2.4 EXISTING FLOOD MITIGATION ACTIVITIES

Flood mitigation activities listed here include current mitigation programs and activities that are implemented by the City of Pomona or other agencies.

FLOOD MANAGEMENT PROJECTS

Flood management structures can assist in regulating flood levels by adjusting water flows upstream of flood-prone areas. There are four dams in the immediate vicinity of the City, holding a total roughly 30,000 acre-feet of water. Releases of water from the impoundments are designed to protect the City of Pomona from high floodwaters. These facilities are:

- San Antonio Dam and Reservoir. 9,350 acre-feet (San Antonio and Chino Creeks);
- Live Oak Reservoir. 2,500 acre-feet (Live Oak)[62]
- Puddingstone Dam and Reservoir. 17,400 acre-feet (Walnut Creek); and
- Thompson Creek Dam and Reservoir. 812 acre-feet (Cobal, Williams, Palmer, Padua, and Thompson Creeks). [63]

[62] *City of Pomona. Materials Recovery Facility Draft Environmental Impact Report. April 1996.*
[63] *Los Angeles County Department of Public Works. Hydrologic Report 1996-1997.*

STORMWATER SYSTEMS

Pomona has an extensive storm drainage network to prevent flooding by conveying water off the streets and into drainage channels. Its existing drainage system is an urban network that generally consists of curbside catch basins, inlet structures, and manholes connected by reinforced concrete laterals and main lines, draining into storm drain channels. The City has approximately 30 miles of drainage pipes and 300 miles of streets that are designed to withstand a 100-year storm event.

Storm water runoff is transported via this network to five major channels. These channels are lined with concrete and designed to accommodate a 200-year storm event: [64]

- *San Antonio Creek and Flood Control Channel*. Located along the westerly and southwesterly limits of the City, it connects to Chino Creek going south;
- *Chino Creek*. Located along the southerly portion of the city in the Puente Hills, it joins to San Antonio Creek further south;
- *Thompson Creek*. Runs from north to south through the northern portion of the City, it bends westward and becomes North San Jose Creek;
- *North San Jose Creek.* Located in the western part of the City, it drains to the Whittier Narrows; and
- *South San Jose Creek*. Parallel to and south of North San Jose Creek in the western portion of the City, stalling from the Corona Expressway and going southwest; drains to the Whittier Narrows.[65]

DAM EMERGENCY PREPAREDNESS

Due to the potential severity of dam failures, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Plans have been established by the USACE and MWD to protect residents and businesses of the affected area in case of dam failures.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

The City of Pomona actively promotes the public participation in the National Flood Insurance Program at every opportunity. City Code Section 18-600 Flood Plain Management was enacted in 2006 to address the requirements of the NFIP and to mitigate the Flood Hazard in the City of Pomona.

[64] *City of Pomona. Master Environmental Assessment. 1994.*
[65] *Ahmad Ansaru. City of Pomona P.E., Assistant City Engineer. Written communication. February 6, 2004.*

Proposed Flooding Mitigation Action Items

The City of Pomona proposes the following wildfire mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 2.6: Localized Flood Control Improvements

11.2.5 EXISTING WINDSTORM MITIGATION ACTIVITIES

As stated, one of the most common problems associated with windstorms is power outage. High winds can cause trees to bend, sag, or fail (tree limbs or entire trees), coming into contact with nearby distribution power lines. Fallen trees can cause short-circuiting and conductor overloading. Wind-induced damage to the power system causes power outages to customers, incurs cost to make repairs, and in some cases can lead to ignitions that start wild land fires.

CALIFORNIA CODE

One of the strongest and most widespread existing mitigation strategies pertains to tree clearance. Currently, California State Law requires utility companies to maintain specific clearances depending on the type of voltage running through the line -between electric power lines and all vegetation.

The following California Public Resource Code Sections establish tree pruning regulations:[66]

- 4293: Power Line Clearance Required 4292: Power Line Hazard Reduction
- 4291: Reduction of Fire Hazards Around Buildings
- 4171: Public Nuisances

The following pertain to tree pruning regulations and are taken from the California Code of Regulations:

- Title 14: Minimum Clearance Provisions
- Sections 1250-1258
- General Industry Safety Orders
- Title 8: Group 3: Articles 12, 13, 36, 37, 38
- California Penal Code Section 385

Finally, the following California Public Utilities Commission section has additional guidance:

- California Public Utilities Commission
- General Order 95: Rule 35

[66] *www.cpuc.ca.gov/js.asp*

Failure to allow a utility company to comply with the law can result in liability to the homeowner for damages or injuries resulting from a vegetation hazard. Many insurance companies do not cover these types of damages if the policy owner has refused to allow the hazard to be eliminated.

The power companies, in compliance with the above regulations, collect data about tree failures and their impact on power lines. This mitigation strategy assists the power company in preventing future tree failure. From the collection of this data, the power company can advise residents as to the most appropriate vegetative planting and pruning procedures.

Proposed Windstorm Mitigation Action Items

The City of Pomona proposes the following windstorm mitigation action items as detailed in **Section 11.3**:

- Mitigation Action 2.8: Build and Retrofit Public Buildings and Critical Facilities
- Mitigation Action 4.2: Vulnerable Building Reinforcement

11.2.6 EXISTING PANDEMIC/INFECTIOUS DISEASE MITIGATION ACTIVITIES

Pandemic/infectious disease outbreaks have the potential to impact not only human lives, but the economic and governing stability of cities. The City of Pomona implemented the following policies in 2007 to protect City staff in the event of an infectious disease outbreak to ensure that City services can be maintained:

- Safety Policy Bloodborne Pathogens
- Safety Policy Respiratory Protection
- Safety Policy Tuberculosis Exposure

These policies were adopted to minimize exposure and outline procedures for reporting and seeking proper treatment following an exposure event.

Proposed Pandemic/Infectious Disease Mitigation Action Items

Due to the COVID 19 pandemic, several measures were adopted in addition to the policies listed above to protect City employees, and additional measures were implemented to protect vulnerable populations, and the economic interests in the City. These mitigations are proposed for inclusion in this LHMP in the event of a future pandemic/infectious disease outbreak:

- Mitigation Action 2.7 City Employee Protection
- Mitigation Action 4.8 Business Community Protection
- Mitigation Action 5.1 Vulnerable Population Services

11.3 MITIGATION ACTION ITEMS

LHMP IMPLEMENTATION STRUCTURE

Mitigation Action 1.1: **Implementation Options for Hazard Mitigation**

Secure necessary funding for implementation of hazard mitigation actions as follows:

- Allocate City resources and assistance for hazard mitigation projects, using available City resources efficiently and with consideration of cost-effectiveness analysis;
- Identify and seek grant programs and foundations that may support mitigation activities; and
- Partner with other government agencies, special districts, utility providers, and organizations involved in hazard mitigation and emergency preparedness and response to pursue grants and special funding programs.

Lead Department: Development Services, Public Works, or Water Resources, depending on the project
Implementation Schedule: Ongoing; apply for grants on an annual basis
Hazards Addressed: All Hazards
Funding Source: General fund, and federal, state, and regional grants
Rank: Level 1
Goals and Objectives Implemented: All

READY CRITICAL FACILITIES AND EMERGENCY SERVICES

Mitigation Action 2.1: **Integrity of Emergency Operation Center**

Maintain the system of the Emergency Operation Center (Brackett Airport in the City of Laverne, at the Pomona Police Department Hanger) with alternative back-up facilities to be activated in the event the central facility is impaired. Because emergency service response times will decrease if back-up locations must be activated, maximize resiliency of the Central Emergency Operations Facility.

Lead Departments: Risk Management
Implementation Schedule: 2022 on schedule
Hazards Addressed: All Hazards
Funding Source: General Fund
Rank: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.4).

- ***Goal 5.1:*** Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.1, 5.1.3, 5.1.4).

Mitigation Action 2.2: **Equip Back-up Emergency Operations Center**

Because the Emergency Operations Center and backup locations were previously clustered in the City center, activating the emergency response system could be impeded if the City center experienced extensive damage during a major earthquake. To ensure response capabilities, the City has designated and will work to equip a backup facility. The Pomona City Yard has been chosen because it is located outside of the City center, south of the I-10 freeway and outside of liquefaction zones.

Lead Department: Risk Management
Implementation Schedule: Complete in 2022
Hazards Addressed: All Hazards
Funding Source: General fund
Rank: Level 2
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.4).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.1, 5.1. 3, 5.1.4, 5.1.5).

Mitigation Action 2.3: **Reinforcement of Historic City Facilities**

Conduct a structural assessment of City-owned properties that are on or eligible for the National Register of Historic Places, the list of California Historic Landmarks, or Pomona's list of local significance, to identify buildings needing seismic safety improvements. Prioritize improvements according to 1) minimizing injury and life loss, 2) ensuring emergency services and response, 3) ensuring distribution of hazard resistant emergency facilities across the City to maximize emergency response and accessibility.

Lead Department: Development Services
Implementation Schedule: Ongoing; review for available funds annually
Hazards Addressed: Earthquake, Wildfire
Funding Source: General fund and grants
Rank: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.3).
- ***Goal 5.1****:* Ensure continued operations when impacted by local hazard events (Objective

5.1.1).

Mitigation Action 2.4: **Establish " Lifeline" Circulation System**

North-south circulation in Pomona could be significantly diminished in the event a long freight train is stranded on the Southern Pacific Railroad due to an earthquake or other hazard event. North-south circulation could also be impaired by significant flooding in the railroad underpasses at White, Towne, and Garey Avenues or the associated bridge collapses due to an earthquake. These scenarios are of particular concern given the location of the City's only hospital north of these potential obstructions and the majority of City population to the south, and require the following actions:

- In the next update of the *General Plan* Safety Element and the *SEMS Plan,* establish "Life-line" circulation system whereby special protocols are enacted to manage traffic flows on White, Towne, and Garey Avenues to ensure adequate north-south access for emergency vehicles. Establish alternative Life-line streets in the event these streets are obstructed, including completion of bridge if the Metrolink Gold Line is extended to Montclair;
- Continue prioritizing maintenance of the pumps in the underpasses;

Lead Department: Development Services, Public Works

Implementation Schedule: Maintenance of pumps ongoing; update to Safety Element General Plan to address evacuation routes to follow the adoption of this LHMP update

Hazards Addressed: All Hazards

Funding Source: General fund and grants

Rank: Level 4

Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.4).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objective 5.1.3).

Mitigation Action 2.5: **Aging Water and Sewer Infrastructure Replacement**

As an older City with the development in the City center dating back to the late 1800s - including the system of water wells and - pipelines portions of the City' s water and sewer infrastructure are in need of extensive maintenance and /or replacement. Older infrastructure is more prone to damage and service disruptions during earthquake, with potential ramifications for public safety and firefighting capabilities. Continue to fund and prioritize water and sewer infrastructure improvements to reduce the potential for these hazard-related risks. Use the Sewer and Water Master Plans as the basis for the improvement schedule.

Lead Department: Water Resources
Implementation Schedule: Ongoing; review for available funds annually
Hazards Addressed: Earthquake, Wildfire

Funding Source: General funds and grants
Rank: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury. and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objective 1.1.1).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objective 5.1.1).

Mitigation Action 2.6: Localized Flood Control Improvements

While the City has an effective flood control system, several localized areas continue to be subject to storm-related flooding. These include underpasses at the intersections of Garey, Towne, and White Avenues and the Union Pacific Railroad tracks; East End Avenue, between Mission Boulevard and Grand Avenue; Ninth Street, between the Union Pacific Railroad tracks and East End Avenue; and cul-de-sacs bounded by SR-60, County Road, Garey Boulevard, and Reservoir Street.

Conduct a study of these localized flooding hazards and identify needed improvements. Determine priority for implementation in part with cost-effectiveness analysis. Once the improvements are identified, consider options for requiring construction of the improvements as part of development projects if appropriate and feasible.

Lead Department: Public Works and Water Resources
Implementation Schedule: Ongoing; 1 – 2 years to complete study
Hazards Addressed: Flooding
Funding Source: 500k from General fund for pump and electrical improvements at Reservoir and 1st Street grade separation.
Rank: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objective 1.1.1).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objective 5.1.1).

Mitigation Action 2.7: City Employee Protection

A pandemic or emerging infectious disease has the potential to severely disrupt City services. During the COVID-19 pandemic, the City established protocols for safely continuing City operations during a pandemic or emerging infectious disease incident. Implement the following

actions:

- Provide work from home opportunities
- Ensure field staff can work alone or use PPE and social distancing measures
- Provide additional equipment and stagger staff shifts

Lead Department: Public Works, Water Resources
Implementation Schedule: This mitigation was implemented during the COVID19 pandemic and can be implemented as necessary in the event of a surge or a new infectious disease outbreak.
Hazards Addressed: Pandemic/Infectious Disease
Funding Source: General fund and available grant funds
Ranking: Level 2
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objectives 1.1.1, 1.1.2).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.1, 5.1.4).

Mitigation Action 2.8: **Build and Retrofit Public Buildings and Critical Facilities**

Public buildings and critical facilities should be constructed or retrofitted to be to the highest standard that is feasible. Improve roof coverings, anchor roof-mounted equipment, and avoid placing flag poles or antennas near buildings.

Lead Department: Public Works, Neighborhood Services, Development Services
Implementation Plan: Ongoing, case-by-case basis when new facilities are constructed, or deficiencies are found in older facilities
Hazards Addressed: Windstorms
Funding Source: General fund and grant funds
Ranking: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objectives 1.1.1, 1.1.2).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.1, 5.1.4).

COMMUNITY PREPAREDNESS AND EDUCATION

Mitigation Action 3.1: **Emergency Preparedness Campaigns**

Continue implementing customized campaigns to educate residents and businesses about appropriate emergency preparedness measures and what to do in the event of a disaster, using the following means of communication:

- Incorporation of special publications and inserts in the City's newsletter and other mailings such as utility bills;
- Traveling booths to set up in shopping centers, community centers, popular athletic fields, schools, and other activity centers;
- Information posted on website and social media;
- Media releases;
- Reports to City Council and City Commissions;
- Presentations to community organizations;
- Events such as the Police Department Open House, Child Safety Fair, and National Night Out; and

When designing and developing campaigns, give special attention to language, demographic, and cultural characteristics of the Pomona population to maximize effectiveness. Target vulnerable populations such as the elderly, poor, disabled, and non-English speakers.

Given the age of many Pomona homes and commercial structures, there should be frequent emphasis on insurance coverage and techniques to secure buildings to avoid seismically induced damage, including information on available assistance programs. Information should be periodically distributed about non-structural improvements to mitigate hazard risks, such as securing bookcases, filing cabinets, light fixtures, and similar objects that can cause injuries and block exits.

Lead Department: Police
Implementation Schedule: Ongoing; events take place quarterly and annually
Hazards Addressed: All Hazards
Funding Source: General fund
Rank: Level 2
Goals and Objectives Implemented:

- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards (Objectives 2.1.1 - 2.1.6).

- ***Goal 4.1****:* Encourage and support leadership within Pomona to promote and implement local hazard mitigation activities (Objectives 4.1.1, 4.1.2, 4.1.4).

RESILIENT HOUSING, NEIGHBORHOODS AND COMMERCIAL DISTRICTS

Mitigation Action 4.1: **Unreinforced Masonry Buildings**

Continue requiring improvements to meet seismic safety standards for unreinforced masonry buildings when a change in use is proposed with tenant improvements.

Lead Department: Development Services
Implementation Schedule: Ongoing; case-by-case as change of use projects are submitted to the City with tenant improvement plans.
Hazards Addressed: Earthquake
Funding Source: Development/permit fees
Rank: Level 1
Goals and Objectives Implemented:

- ***Goal 1.2****:* Protect Pomona's unique character and values from being compromised by hazard events (Objectives 1.2.1, 1.2.2, 1.2.3).
- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objectives 1.3.4, 1.3.5).

Mitigation Action 4.2: Vulnerable Building Reinforcement

Much of the City was developed prior to current seismic standards. Older homes and buildings may require structural intervention to avoid significant damage in the event of a major earthquake or severe windstorm. In addition, the clusters of mobile homes in the City may need reinforcements such as foundation strappings. Structural interventions are often straightforward and cost-effective, such as bolting structures to foundations. Through community education campaigns, educate property owners about areas with structures potentially needing reinforcement, and provide technical assistance to property owners with vulnerable buildings to implement retrofit standards.

This action will be most effective when City building inspection staff are directed to prioritize identification and reinforcement of vulnerable buildings, are appropriately trained to detect vulnerable buildings and make reasonable, cost-efficient recommendations, and are consulted during formulation of community education campaigns.

Lead Department: Development Services
Implementation Schedule: Ongoing; case-by-case as improvement plans are submitted to the City, and educational materials provided at the Development Services Department counter.
Hazards Addressed: Earthquake, Windstorm
Funding Source: General fund
Rank: Level 2
Goals and Objectives Implemented:

- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objectives 1.3.3, 1.3.4).
- ***Goal 2.1****:* Develop and implement education and outreach programs to increase

public awareness of the risks associated with natural hazards (Objectives 2.1.5, 2.1.6).

Mitigation Action 4.3: **Valuing Heritage**

Many of Pomona's designated historic buildings, as well as homes within the designated historic districts, do not meet seismic safety codes. Pomona's historic resources contribute greatly to local environment and culture and are tremendously valued by the community. Prioritize retrofitting City-owned historic structures and avoid demolition for the purpose of public safety. Explore opportunities for federal and state grants for structural improvements to make City-owned buildings safer in lieu of demolition.

Lead Department: Development Services
Priority: Ongoing; annually review department budget and pursue grants
Hazards Addressed: Earthquake
Funding Source: General fund and grants
Ranking: Level 3
Goals and Objectives Implemented:

- ***Goal 1.2****:* Protect Pomona's unique character and values from being compromised by hazard events (Objectives 1.2.1, 1.2.2, 1.2.3).

Mitigation Action 4.4: **Reduce Wildfire Threat**

Continue existing programs to reduce risk of property damage and injury from wildfire, including:

- Citywide prohibition of new wood and wood shake roofing materials, and requirement of fire-resistant materials for re-roofing projects.
- Requirement of tile roofs in Phillips Ranch;
- Development of fire-resistant landscape program in coordination with Ganesha Hills homeowners; and
- County Fire Department weed abatement and brush clearance program.

Further measures to reduce the risks of wildfire include:

- Exploring options for further decreasing fire hazards through requirements established by ordinance in Ganesha Hills; and
- Limiting any increases in residential densities in wildfire hazard areas through appropriate land use policy applications in the General Plan Update.

Lead Department: Development Services, Fire Department
Implementation Schedule: Ongoing; review department funds and resources for development of new ordinances. Review of re-roofing projects occur on case-by-case basis as projects are

submitted to the City.
Hazards Addressed: Wildfire
Funding Source: General fund and grants
Ranking: Level 4
Goals and Objectives Implemented:

- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objective 1.3.1).
- ***Goal 3.1****:* Balance natural resource management, and land use planning with local hazard mitigation to protect life, property, and the environment (Objective s 3.1.1, 3.1.2).

Mitigation Action 4.5: Expanded Code Enforcement in Overcrowded Neighborhoods

In Pomona's overcrowded neighborhoods:

- Step up code enforcement efforts, with particular emphasis on remediation of illegally inhabited building spaces that increase risks of injury or life loss in the event of a major earthquake.
- Significantly increase fees for code violations pertinent to public health and safety, so that the fees serve as a deterrent; and
- Continue enforcing stiff fines imposed on homeowners and contractors implementing structural modifications without appropriate permits.

Lead Department: Development Services
Implementation Schedule: Implemented, and ongoing as regular inspections are conducted, or complaints received
Hazards Addressed: Earthquakes
Funding Source: General fund and code violation fees
Ranking: Level 1
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities. (Objective 1.1.3).
- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objective 1.3.4).

Mitigation Action 4.6: Landslide Prevention

Prioritize routine maintenance and repairs of water, sewer, and irrigation lines in and around landslide prone areas to avoid long-term leaks that saturate and de-stabilize earth materials to point of dangerous and destructive landslides.

Lead Department: Water Resources, Community Services, Public Works
Implementation Schedule: Ongoing**;** irrigation lines inspected on quarterly basis
Hazards Addressed: Landslide
Funding Source: General fund
Ranking: Level 2
Goals and Objectives Implemented:

- ***Goal 3.1****:* Balance natural resource management, and land use planning with local hazard mitigation to protect life, property, and the environment (Objectives 3.1.1, 3.1.2).

Mitigation Action 4.7: **Landslide Prevention Development Standards**

Revise the City Grading Ordinance and development standards for hillside properties implemented through the " H" Overlay Zone to include best management practices for landslide prevention. Review the extent of property subject to the overlay to ensure that all landslide potential areas are included and also continue applying the standards to all property meeting the requirements of "Hillside Area" as defined in Development Code Section 58010.

Lead Department: Development Services
Implementation Schedule: Zoning and Development Code currently undergoing update; completion expected by 2023.
Hazards Addressed: Landslide
Funding Source: General fund and grants
Ranking: Level 3
Goals and Objectives Implemented:

- ***Goal 1.2****:* Protect Pomona's unique character and values from being compromised by hazard events (Objective 1.2.3).
- ***Goal 3.1****:* Balance natural resource management, and land use planning with local hazard mitigation to protect life, property, and the environment (Objectives 3.1.1, 3. 1.2).

Mitigation Action 4.8: **Business Community Protection**

During an infectious disease outbreak, businesses can become severely impacted and may require modified operations from what would normally be permitted. Additionally, the city may need to modify normal operations to ensure development applications can continue. To protect the local economy, the following actions should be taken to ensure business operations and development can continue:

- Wave temporary use/special event permit fees,
- Work with businesses to modify operations for social distancing,
- Establish protocol for electronic submission of applications,

- Teleconferencing should be used in place of in person meetings whenever possible.
- Provide information to businesses about grants for PPE.

Lead Department: Development Services
Implementation Schedule: This mitigation was implemented during the COVID19 pandemic and can be implemented as necessary in the event of a surge or a new infectious disease outbreak.
Hazards Addressed: Pandemic/Infectious Disease
Funding Source: General fund and available grant funds
Ranking: Level 1
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objectives 1.1.1, 1.1.2).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.2, 5.1.3, 5.1.4).

RISK REDUCTION FOR COMMUNITY VULNERABILITIES

Mitigation Action 5.1: **Vulnerable Population Services**
Vulnerable populations may be particularly impacted by a pandemic or infectious disease outbreak. The following mitigation can be implemented to reduce those impacts to the most vulnerable populations in the city:

- Employ eviction prevention programs,
- Provide emergency housing vouchers, rental assistance, and legal services,
- Hold vaccination events in areas easily accessible by vulnerable populations,
- Host zoom events for underprivileged children in the community.

Lead Department: Neighborhood Services
Implementation Schedule: This mitigation was implemented during the COVID19 pandemic and can be implemented as necessary in the event of a surge or a new infectious disease outbreak.
Hazards Addressed: Pandemic/Infectious Disease
Funding Source: General fund, and available grant funding including homeless prevention grants
Ranking: Level 4
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objectives 1.1.1, 1.1.2, 1.1.3).
- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards (Objectives 5.1.1, 5.1.2, 5.1.5).

DEVELOPMENT PLANNING AND REGULATORY FRAMEWORK

Mitigation Action 6.1: **General Plan and Development Code Update**

In the General Plan Update and associated Zoning Code amendments, integrate the hazards and risk assessment and mitigation in the new policy framework, with special attention to avoidance of new risks from proposed development, protection of environmental resources, appropriate level of public services and facilities, and circulation system effectiveness. As indicated in **Section 1.4**, the Safety Element of the General Plan will be updated to address evacuation routes following the adoption of this LHMP update. Establish development policies that encourage and support redevelopment of aging building stock, consistent with community vision and goals.

Lead Department: Development Services
Implementation Schedule: Development Code update currently underway with completion expected in 2023. Complete General Plan update in the next 4-5 years.
Hazards Addressed: All Hazards
Funding Source: SB 2 grant and general fund
Ranking: Level 3
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objective 1.1.3).
- ***Goal 1.2***: Protect Pomona's unique character and values from being compromised by hazard events (Objectives 1.2.2, 1.2.3).
- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objectives 1.3.1, 1.3 .4, 1.3.5,1.3.6).
- ***Goal 3.1****:* Balance natural resource management and land use planning with local hazard mitigation to protect life, property, and the environment (Objectives 3.1.1, 3.1.2).

Mitigation Action 6.2: **Development Project Review for Natural Hazards Risks**

When reviewing proposals for new development and infrastructure improvement projects, identify any natural hazards that have the potential to impact the property. If current building and development codes do not adequately address identified natural hazard impacts associated with a specific project, require additional mitigation to be incorporated into the project. Include this requirement in all project review procedures.

Lead Department: Development Services
Implementation Schedule: Ongoing; case-by-case basis as development projects are submitted to the City.
Hazards Addressed: All Hazards
Funding Source: User fees, permit fees, and environmental review fees
Ranking: Level 1
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses (Objective 1.1.3).
- ***Goal 1.2***: Protect Pomona's unique character and values from being compromised by hazard events (Objectives 1.2.2, 1.2.3).
- ***Goal 1.3****:* Minimize losses to existing property and reduce potential for damage to future development (Objectives 1.3.1, 1.3 .4, 1.3.5,1.3.6).
- ***Goal 3.1****:* Balance natural resource management and land use planning with local hazard mitigation to protect life, property, and the environment (Objectives 3.1.1, 3.1.2).

CITY EMERGENCY OPERATION PLAN (EOP) AND STANDARDIZED EMERGENCY MANAGEMENT SYSTEMS (SEMS) PLANNING AND TRAINING

Mitigation Action 7.1: **Pomona SEMS Plan**

Continue to implement the Pomona SEMS Plan contained within the City's EOP*,* which functions as the City's manual for communications protocol in the event of a disaster. Update as needed for consistency with the State SEMS Plan involving interagency communication protocols, and this LHMP. Mobile command center system recently purchased for the Emergency Operation Center.

Lead Department: Risk Management
Implementation Schedule: Ongoing; review SEMS plan annually for consistency with State SEMS Plan.
Hazards Addressed: All Hazards
Funding Source: General plan and grants
Ranking: Level 1
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential injury, and economic damage residents and businesses by Emergency preparedness for life loss, to Pomona maximizing capabilities. (Objectives 1.1.2, 1.1.3, 1.1.4).
- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards (Objectives 2.1.1, 2.1.2, 2.1.3, 2.1.4).
- ***Goal 4.1****:* Encourage and support leadership within Pomona to promote and implement local hazard mitigation activities (Objectives 4.1.1, 4.1.3, 4.1.4, 4.1.5).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.2, 5.1.3).

Mitigation Action 7.2: **Emergency Preparedness Drills**

Pursuant to the City's Emergency Operations Plan (EOP)*,* conduct emergency preparedness and response drills for mock major earthquake events, the natural hazard with the greatest potential

for injury, loss life, property damage, and service interruptions. Drills should test disaster response systems and communication protocols. When preparing the drills, consider the wide range of potential risks associated with critical facilities and vulnerabilities, such as interrupted service at Pomona Valley Hospital Medical Center, street blockages from paused trains, major power service disruption, etc. Include representatives of City officials and staff, utility providers and the railroad operators, as well as trained community emergency response volunteers and emergency response stakeholders, and representatives of vulnerable facilities.

After the drill, analyze the strengths and weaknesses of the response effort and identify facility and infrastructure deficiencies contributing to response concerns. Use this information to inform priorities established in the LHMP Annual Report.

Lead Department: Risk Management
Implementation Schedule: Ongoing, on annual basis
Hazards Addressed: All Hazards
Funding Source: General plan and grants
Ranking: Level 4
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1.2, 1.1.3, 1.1.4).
- ***Goal 2.1****:* Develop and implement education and outreach programs to increase public awareness of the risks associated with local hazards (Objectives 2.1.1, 2.1.2, 2.1.3, 2.1.4).
- ***Goal 4.1****:* Encourage and support leadership within Pomona to promote and implement local hazard mitigation activities (Objectives 4.1.1, 4.1. 3, 4.1.4, 4.1.5, 5.1.2, 5.1.3, 5.1.4, 5.1.6).

Mitigation Action 7.3: City Hall Life Safety Planning

Immediately following a disaster, community members will rely on City staff for assistance and direction. Part of the City's plan for maximizing emergency services must include taking care of staff's emergency needs so that they can function and serve the community. Without the ready services of City staff, the likelihood of hazard impacts to the community could increase.

Update City Hall Life Safety Preparedness Plan, conduct employee training, ensure that each department has complete first-aid kit, and hold emergency evacuation drills at City Hall on an annual basis. In addition, help staff establish reserve of personal emergency supplies, by buying kits at discounted prices and selling at-cost to staff or designating a team captain in each department to help individuals bring in appropriate kit.

Lead Department: Risk Management
Implementation Schedule: Ongoing; drills conducted annually and updates to Life Safety

Preparedness Plan to occur as needed
Hazards Addressed: All Hazards
Funding Source: General fund and grants
Ranking: Level 2
Goals and Objectives Implemented:

- ***Goal 1.1****:* Reduce the potential for life loss, injury, and economic damage to Pomona residents and businesses by maximizing emergency preparedness capabilities (Objectives 1.1.1, 1.1. 2).
- ***Goal 5.1****:* Ensure continued operations when the City is impacted by local hazard events (Objectives 5.1.4, 5.1.6).

11.4 PROGRESS IN LOCAL MITIGATION EFFORTS

Several Mitigation Actions included in **Section 11.3**, reflect actions that are ongoing as part of regular operations conducted by the City in an effort to mitigate or reduce the impacts of local hazards on the community. Some of these Mitigation Actions have been recently completed but may include some ongoing effort or additional component to complete in entirety. Additionally, some of the Mitigation Actions have been included that were implemented during the COVID 19 pandemic, that may be implemented if a future pandemic or infectious disease outbreak occurs in the City as necessary and based on relevance in a novel situation. The following Mitigation Actions reflect efforts that are ongoing as part of regular City operations:

- Mitigation Action 1.1: Implementation Options for Hazard Mitigation
- Mitigation Action 2.3: Reinforcement of Historic City Facilities
- Mitigation Action 2.4: Establish " Lifeline" Circulation System (component of this action is ongoing)
- Mitigation Action 2.5: Aging Water and Sewer Infrastructure Replacement
- Mitigation Action 2.8: Build and Retrofit Public Buildings and Critical Facilities
- Mitigation Action 3.1: Emergency Preparedness Campaigns
- Mitigation Action 4.1: Unreinforced Masonry Buildings
- Mitigation Action 4.2: Vulnerable Building Reinforcement
- Mitigation Action 4.3: Valuing Heritage
- Mitigation Action 4.4: Reduce Wildfire Threat
- Mitigation Action 4.5: Expanded Code Enforcement in Overcrowded Neighborhoods
- Mitigation Action 4.6: Landslide Prevention
- Mitigation Action 6.2: Development Project Review for Natural Hazards Risks
- Mitigation Action 7.1: Pomona SEMS Plan
- Mitigation Action 7.2: Emergency Preparedness Drills

- Mitigation Action 7.3: City Hall Life Safety Planning

The following Mitigation Action was completed during the preparation of this LHMP update:

- Mitigation Action 2.1: Integrity of Emergency Operation Center

The following Mitigation Actions were implemented during the COVID 19 pandemic and can be reinstated as necessary or relevant:

- Mitigation Action 2.7: City Employee Protection
- Mitigation Action 4.8: Business Community Protection
- Mitigation Action 5.1: Vulnerable Population Services

Appendix A:

Public Participation Survey Materials & TAC Meeting Agendas

PUBLIC SURVEY FLYER – ENGLISH AND SPANISH





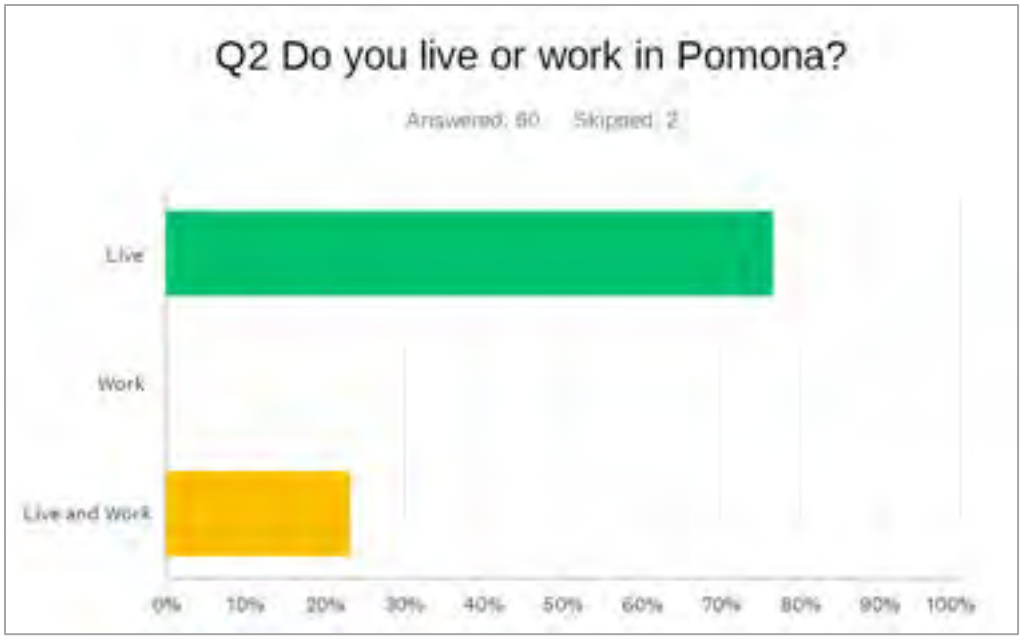
PUBLIC SURVEY SOCIAL MEDIA POST



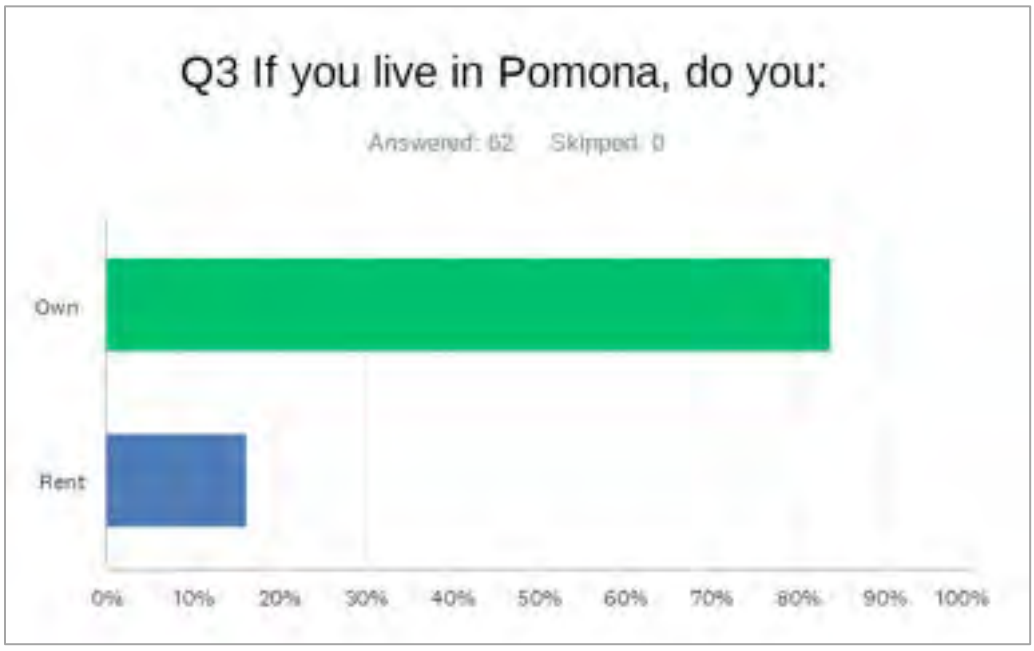
2021 Pomona Local Hazard Mitigation Plan Update Survey

1. Your Zip Code Answers varied and Community Name or Location Answers varied

2. Do you: ☐ Live or ☐ Work in Pomona?



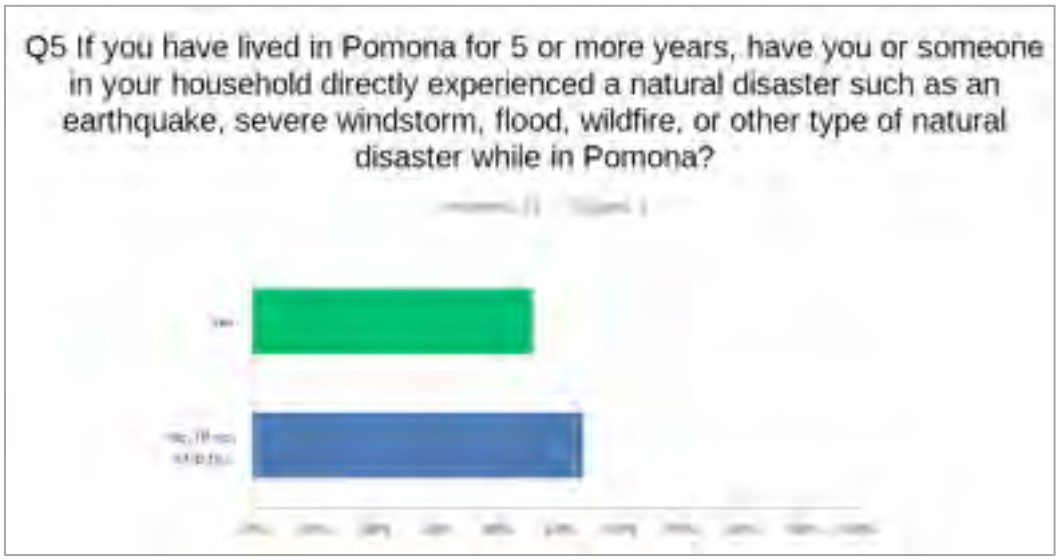
3. If you live in Pomona, do you: ☐ Own or ☐ Rent?



4. If you live in Pomona, how many years? Answers varied from 1 to 50 years.

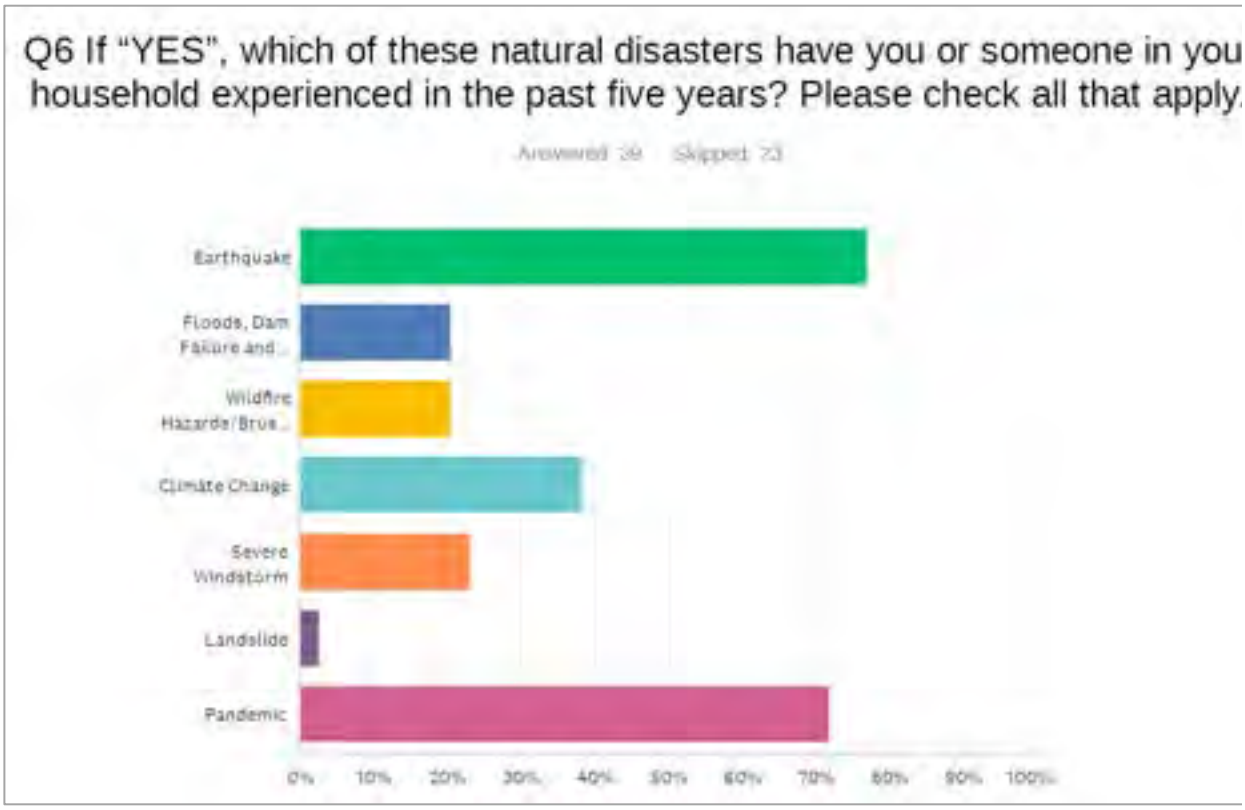
5. If you have lived in Pomona for 5 years or more, have you or someone in your household directly experienced a natural disaster such as an earthquake, severe windstorm, flood, wildfire, or other type of natural disaster while in Pomona?

☐ Yes ☐ No (**IF NO, skip to question 7**)



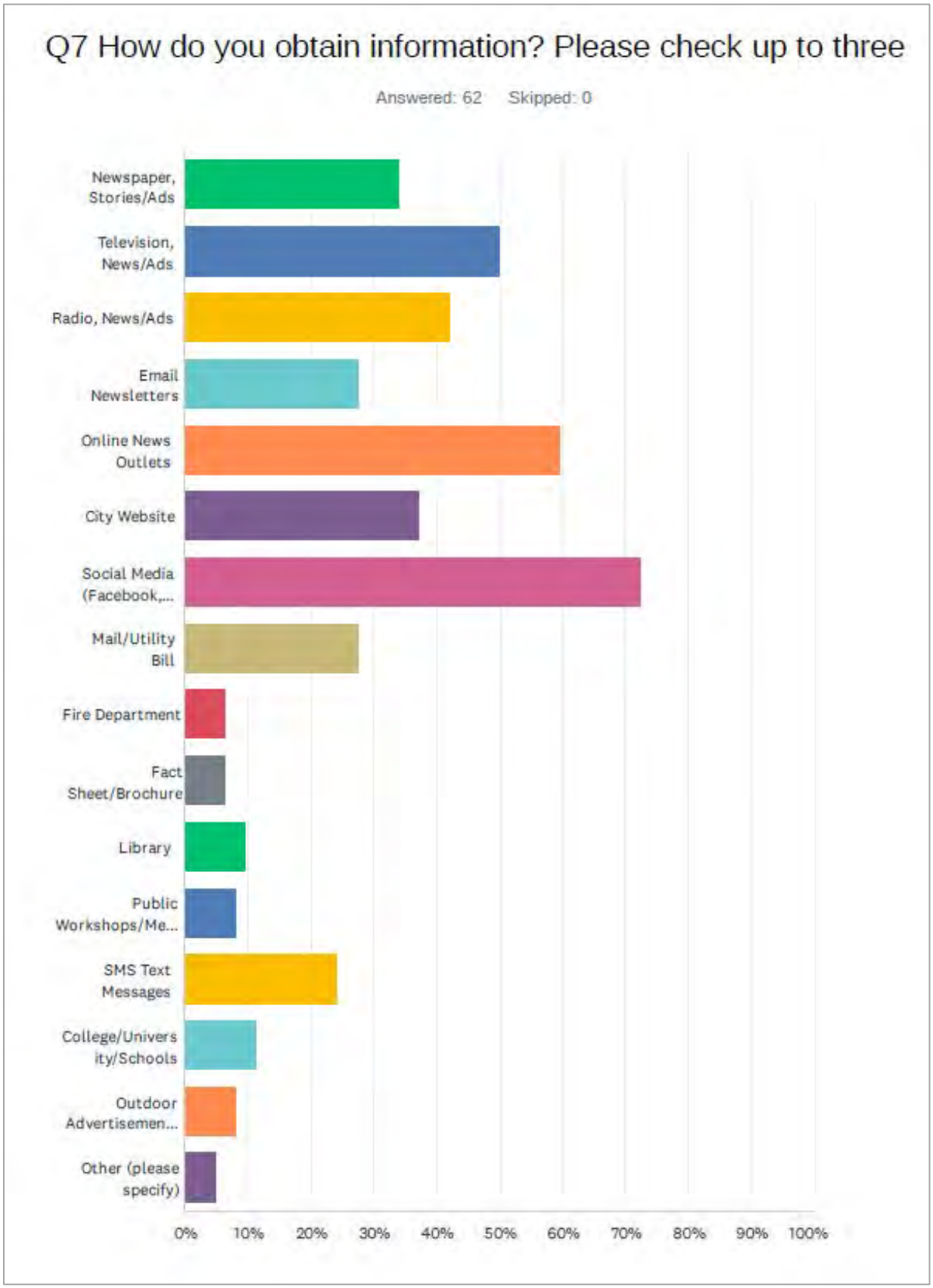
6. **If "YES"**, which of these natural disasters have you or someone in your household experienced in the past five years? (**Please check all that apply**)

☐ Earthquake
☐ Floods, Dam Failure and Inundation Hazards
☐ Wildfire Hazards/Brush Fire
☐ Climate Change
☐ Severe Windstorm
☐ Landslide
☐ Pandemic



7. How do you get information? (**Please check up to three**)

☐ Newspaper stories/ads
☐ Television news/ads
☐ Radio News/ads
Internet:
☐ Email newsletters
☐ Online news outlets
☐ City web site
☐ Social media (e.g. Facebook, Twitter, Instagram, etc.)
☐ Mail/Utility Bill
☐ Fire Department
☐ Fact sheet/Brochure
☐ Library
☐ Public workshops/Meetings
☐ SMS text message
☐ College/University/Schools
☐ Outdoor advertisements (billboards)
☐ Other: _____


Q7 How do you obtain information? Please check up to three
Answered: 62 Skipped: 0
Newspaper, Stories/Ads
Television, News/Ads
Radio, News/Ads
Email Newsletters
Online News Outlets
City Website
Social Media (Facebook,...
Mail/Utility Bill
Fire Department
Fact Sheet/Brochure
Library
Public Workshops/Me...
SMS Text Messages
College/University/Schools
Outdoor Advertisemen...
Other (please specify)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

#	OTHER (PLEASE SPECIFY)	DATE
1	Nixle	10/18/2021 11:21 AM
2	Nextdoor.com	7/15/2021 10:48 AM
3	People in the community reach out to me for information and to place their articles and ads in our paper to help get the word out.	7/15/2021 10:29 AM

8. How concerned are you about the following hazards?

Natural Disaster	Very Concerned	Somewhat Concerned	Neutral	Not Very Concerned	Not Concerned
Climate Change	☐	☐	☐	☐	☐
Severe Windstorm	☐	☐	☐	☐	☐
Flood, Dam Failure and Inundation Hazards	☐	☐	☐	☐	☐
Wildfire Hazards/Brush Fire	☐	☐	☐	☐	☐
Landslides	☐	☐	☐	☐	☐
Pandemic	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐

2021 Pomona Local Hazard Mitigation Plan Update Survey

	NOT CONCERNED	NOT VERY CONCERNED	NEUTRAL	SOMEWHAT CONCERNED	VERY CONCERNED	TOTAL
Climate Change	1.61% 1	1.61% 1	8.06% 5	17.74% 11	70.97% 44	62
Severe Windstorm	11.67% 7	8.33% 5	35.00% 21	26.67% 16	18.33% 11	60
Flood, Dam Failure and Inundation Hazards	11.29% 7	11.29% 7	40.32% 25	19.35% 12	17.74% 11	62
Wildfire Hazards/Brush Fire	1.64% 1	3.28% 2	14.75% 9	37.70% 23	42.62% 26	61
Landslides	13.33% 8	20.00% 12	35.00% 21	21.67% 13	10.00% 6	60
Pandemic	1.64% 1	6.56% 4	13.11% 8	24.59% 15	54.10% 33	61
Earthquake	0.00% 0	1.64% 1	6.56% 4	36.07% 22	55.74% 34	61

9. Planning ahead for responding to disasters can help lessen their impact. To help the City prioritize its disaster preparedness efforts, please tell us how important each of the following goals is to you.

Goal	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	☐	☐	☐	☐	☐
Protecting critical facilities (hospitals, fire stations, etc.)	☐	☐	☐	☐	☐
Preventing development in hazard areas	☐	☐	☐	☐	☐
Protecting the natural environment	☐	☐	☐	☐	☐
Protecting historical/cultural landmarks, museums, etc.	☐	☐	☐	☐	☐
Promoting cooperation among public and private organizations and citizens	☐	☐	☐	☐	☐
Protecting and reducing damage to utilities	☐	☐	☐	☐	☐
Strengthening emergency services (police, fire, ambulance)	☐	☐	☐	☐	☐
Protecting major employers	☐	☐	☐	☐	☐
Protecting small businesses	☐	☐	☐	☐	☐
Protecting K-12 schools	☐	☐	☐	☐	☐
Protecting Colleges/Universities	☐	☐	☐	☐	☐

	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Protecting Private Property	1.64% 1	3.28% 2	4.92% 3	16.39% 10	73.77% 45	61
Protecting Critical Facilities (hospitals, fire stations, etc.)	1.67% 1	1.67% 1	0.00% 0	8.33% 5	88.33% 53	60
Preventing Development in Hazard Areas	4.92% 3	1.64% 1	6.56% 4	29.51% 18	57.38% 35	61
Protecting the Natural Environment	1.67% 1	1.67% 1	6.67% 4	25.00% 15	65.00% 39	60
Protecting Historical/Cultural Landmarks, Museums, etc.	4.92% 3	4.92% 3	16.39% 10	36.07% 22	37.70% 23	61
Promoting Cooperation among Public and Private Organizations and Citizens	3.28% 2	1.64% 1	14.75% 9	21.31% 13	59.02% 36	61
Protecting and Reducing Damage to Utilities	1.64% 1	1.64% 1	1.64% 1	14.75% 9	80.33% 49	61
Strengthening Emergency Services (police, fire, ambulance, etc.)	1.64% 1	1.64% 1	1.64% 1	19.67% 12	75.41% 46	61
Protecting Major Employers	3.28% 2	6.56% 4	39.34% 24	26.23% 16	24.59% 15	61
Protecting Small Businesses	3.28% 2	3.28% 2	21.31% 13	26.23% 16	45.90% 28	61
Protecting K-12 schools	1.67% 1	1.67% 1	20.00% 12	15.00% 9	61.67% 37	60
Protecting Colleges/Universities	3.39% 2	6.78% 4	23.73% 14	18.64% 11	47.46% 28	59

10. Community assets are features, characteristics, or resources that either make a community unique or allow the community to function. Please rank the importance of protecting the following community assets:

Community Assets: **Potential Disaster Impact**	**Very Important**	**Somewhat Important**	**Neutral**	**Not Very Important**	**Not Important**
Human**:** Loss of life and/or injuries	☐	☐	☐	☐	☐
Economic**:** Business closures and/or job losses	☐	☐	☐	☐	☐
Infrastructure**:** Damage or loss of bridges, utilities, schools, etc.	☐	☐	☐	☐	☐
Cultural Historic**:** Damage or loss of libraries, museums, fairgrounds, etc.	☐	☐	☐	☐	☐
Environmental**:** Damage or loss of forests, rangeland, waterways, etc.	☐	☐	☐	☐	☐
Governance**:** Ability to maintain order and/or provide public amenities and services	☐	☐	☐	☐	☐

	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Human: Loss of Life and/or Injuries	0.00% 0	1.61% 1	1.61% 1	6.45% 4	90.32% 56	62
Economic: Business Closures and/or Job Losses	1.61% 1	0.00% 0	12.90% 8	29.03% 18	56.45% 35	62
Infrastructure: Damage or Loss of Bridges, Utilities, Schools, etc.	1.61% 1	1.61% 1	3.23% 2	17.74% 11	75.81% 47	62
Cultural Historic: Damage or Loss of Libraries, Museums, Fairgrounds, etc.	3.23% 2	4.84% 3	27.42% 17	22.58% 14	41.94% 26	62
Environmental: Damage or Loss of Forests, Rangeland, Waterways, etc.	1.61% 1	3.23% 2	9.68% 6	25.81% 16	59.68% 37	62
Governance: Ability to Maintain Order and/or Provide Public Amenities and Services	1.64% 1	1.64% 1	6.56% 4	13.11% 8	77.05% 47	61

11. Have you taken any of the following steps to prepare for your household for potential disasters? Check all that apply.

☐ Purchased homeowners/renters insurance
☐ Purchased flood insurance

☐ Floodproofing (elevating furnace, water heaters, electric panels
☐ Installed retrofits such as high impact windows or doors to withstand high winds; fire resistant siding roofing or window

☐ Attended meetings or received written information on natural disasters or emergency preparedness
☐ Talked with family members about what to do in case of a disaster or emergency
☐ Developed a “Household/Family Emergency Plan” in order to decide what everyone would do in the event of a disaster

screens, etc.
☐ Installed/maintained firebreaks around the home

☐ Prepared a "Disaster Supply Kit" (extra food, water, batteries, medications, first aid, etc.)

	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Human: Loss of Life and/or Injuries	0.00% 0	1.61% 1	1.61% 1	6.45% 4	90.32% 56	62
Economic: Business Closures and/or Job Losses	1.61% 1	0.00% 0	12.90% 8	29.03% 18	56.45% 35	62
Infrastructure: Damage or Loss of Bridges, Utilities, Schools, etc.	1.61% 1	1.61% 1	3.23% 2	17.74% 11	75.81% 47	62
Cultural Historic: Damage or Loss of Libraries, Museums, Fairgrounds, etc.	3.23% 2	4.84% 3	27.42% 17	22.58% 14	41.94% 26	62
Environmental: Damage or Loss of Forests, Rangeland, Waterways, etc.	1.61% 1	3.23% 2	9.68% 6	25.81% 16	59.68% 37	62
Governance: Ability to Maintain Order and/or Provide Public Amenities and Services	1.64% 1	1.64% 1	6.56% 4	13.11% 8	77.05% 47	61

12. How would you rank the following strategies to address pre- and post-disaster damage?

Strategy	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Retrofit and strengthen essential facilities such as police, fire, emergency medical services, hospitals, schools, etc.	☐	☐	☐	☐	☐
Replace inadequate or vulnerable bridges and causeways	☐	☐	☐	☐	☐
Install or improve protective structures, such as floodwalls or levees	☐	☐	☐	☐	☐
Government buys flood-prone properties and returns them to a natural condition	☐	☐	☐	☐	☐
Assist property owners with securing funding to mitigate impacts to their property caused by disasters	☐	☐	☐	☐	☐
Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities, etc.	☐	☐	☐	☐	☐

Strengthen City codes, ordinances, and plans to require high risk management standards	☐	☐	☐	☐	☒
Provide better information about hazard risk and high-hazard areas	☐	☐	☐	☐	☐
Inform property owners of ways they can prevent damage to their properties	☐	☐	☐	☐	☐

	NOT IMPORTANT	NOT VERY IMPORTANT	NEUTRAL	SOMEWHAT IMPORTANT	VERY IMPORTANT	TOTAL
Retrofit and strengthen essential facilities such as police, fire, emergency medical services, hospitals, schools, etc.	1.61% 1	3.23% 2	6.45% 4	24.19% 15	64.52% 40	62
Replace inadequate or vulnerable bridges and causeways	1.61% 1	1.61% 1	3.23% 2	24.19% 15	69.35% 43	62
Install or improve protective structures, such as floodwalls or levees	6.45% 4	6.45% 4	16.13% 10	27.42% 17	43.55% 27	62
Government buys flood-prone properties and returns them to a natural condition	8.06% 5	8.06% 5	30.65% 19	24.19% 15	29.03% 18	62
Assist property owners with securing funding to mitigate impacts to their property caused by disasters	0.00% 0	3.23% 2	14.52% 9	20.97% 13	61.29% 38	62
Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities, etc.)	1.61% 1	1.61% 1	4.84% 3	22.58% 14	69.35% 43	62
Strengthen City codes, ordinances, and plans to require high risk management standards	1.64% 1	6.56% 4	19.67% 12	22.95% 14	49.18% 30	61
Provide better information about hazard risk and high-hazard areas	0.00% 0	1.64% 1	8.20% 5	31.15% 19	59.02% 36	61
Inform property owners of ways they can prevent damage to their properties	0.00% 0	1.61% 1	4.84% 3	24.19% 15	69.35% 43	62

13. Please feel free to provide any additional comments:

Interwest Consulting Group

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E-mail: cpower@interwestgrp.com

Technical Advisory Committee Interview Agenda—Neighborhood Services
January 27, 2022

1. Discuss outstanding questions:
    - A. List of transitional housing and senior care facilities
    - B. Information about Housing Division rental and mortgage assistance, housing and rehab and façade improvement programs
    - C. List of community centers and City Parks
    - D. YMCA

2. Discuss mitigation actions from previous Hazard Mitigation Plan
    - A. Landslide prevention (5.6) - Community Services?
    - B. Stabilizing Ganesha Park slopes (5.8) - Community Services?
    - C. Vulnerable population services (6.2) - New; this was added to the pandemic section of the update

3. Discuss any new mitigation actions that should be included in update, considering the following:
    - A. Projects already planned for—studies, funding, commencement, completion in the next 5 years (implementation schedule)
    - C. Funding
    - D. Hazard(s) addressed
    - E. Goals and objectives addressed

Interwest Consulting Group

Contact: Chantal Power, AICP
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Technical Advisory Committee Interview Agenda—Water Resources
February 3, 2022

1. Discuss outstanding questions:
    - A. Retrofits since last HMP update
    - B. Mitigations implemented following 2003 report regarding structural stability of city reservoirs
    - C. City ground water wells
    - D. City reservoirs, and retrofits

2. Discuss mitigation actions from previous Hazard Mitigation Plan
    - A. Implementation options for hazard mitigation (1.2)
    - B. Water reservoir seismic retrofit completion (2.5)
    - C. Aging water and sewer infrastructure replacement (2.6)
    - D. City employee protection (2.9) - New; added for new pandemic section
    - E. Landslide prevention (5.6)

3. Discuss any new mitigation actions that should be included in update, considering the following:
    - A. Projects already planned for studies, funding, commencement, completion in the next 5 years (implementation schedule)
    - C. Funding
    - D. Hazard(s) addressed
    - E. Goals and objectives addressed

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Public Works
February 3, 2022

1. Discuss outstanding questions:
    - A. Retrofits since last HMP update
    - B. Mitigations implemented following 2003 Ganesha Park landslide report
    - C. Wastewater diverted to JWPCP in Carson
    - D. Areas of flood concern

2. Discuss mitigation actions from previous Hazard Mitigation Plan
    - A. Implementation options for hazard mitigation (1.2)
    - B. Establish "Lifeline" circulation system (2.4)
    - C. Localized flood control improvements (2.7)
    - D. City employee protection (2.9) - New; added for new pandemic section
    - E. Landslide prevention (5.6)

3. Discuss any new mitigation actions that should be included in update, considering the following:
    - A. Completion of Goldline
    - B. Public Works/CIP projects already planned for studies, funding, commencement, completion in the next 5 years (implementation schedule)
    - C. Funding
    - D. Hazard(s) addressed
    - E. Goals and objectives addressed

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Water Resources
February 7, 2022

1. Discuss outstanding questions:
    - A. Copy of SEMS Plan

2. Discuss mitigation actions from previous Hazard Mitigation Plan
    - A. Mitigation Actions under outside agency authority (2.8 & 4.2)
        - 1) Back-up medical services (2.8)
        - 2) Community emergency volunteers
    - B. Coordinator and LHMP committee (1.1)
    - C. Integrity of emergency operation center system (2.1)
    - D. Back-up emergency operations center (2.2)
    - E. Hazard mitigation partners (4.3)
    - F. Pomona SEMS Plan (8.1)
    - G. Emergency preparedness drills (8.2)
    - H. Decentralized emergency supplies and equipment (8.3)
    - I. City Hall life safety planning (8.4)

3. Discuss any new mitigation actions that should be included in update, considering the following:
    - A. Projects already planned for studies, funding, commencement, completion in the next 5 years (implementation schedule)
    - C. Funding
    - D. Hazard(s) addressed
    - E. Goals and objectives addressed

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Development Services
February 14, 2022

1. Discuss outstanding questions:
   - A. URM buildings in the City
   - B. URM City owned facilities
   - C. List of Historic Resources
   - D. Housing Element—overcrowded neighborhoods and soft-story multi-family housing
   - E. Safety Element update pursuant to SB 99 and AB 747
   - F. Housing vs population growth number, percent of housing types, and vacancy rates
   - G. Properties on National Register of Historic Places, Historic Landmarks, Pomona's Landmark Register
   - H. Percent of City located in liquefaction zones
   - I. Construction date of facilities used during emergencies

2. Discuss mitigation actions from previous Hazard Mitigation Plan
   - A. Implementation options for hazard mitigation (1.2)
   - B. Reinforcement of other City facilities (2.3)
   - C. Establish "Lifeline" circulation system (2.4)
   - D. Unreinforced masonry buildings (5.1)
   - E. Vulnerable buildings reinforced (5.2)
   - F. Valuing heritage (5.3)
   - G. Reduce wildfire threat (5.4)
   - H. Expanded Code Enforcement in overcrowded neighborhoods (5.5)
   - I. Landslide prevention development standards (5.7)
   - J. Business community protection (5.9); New, added for pandemic hazards
   - K. General Plan and Development Code update (7.1)
   - L. Development project review for natural hazards risks (7.2)

3. Discuss any new mitigation actions that should be included in update.

Interwest Consulting Group

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Technical Advisory Committee Interview Agenda—Police Department
March 7, 2022

1. Discuss mitigation actions from previous Hazard Mitigation Plan
   A. Early Warning Systems and Local Consideration (3.1)
   B. Emergency Preparedness Campaigns (4.1)
   C. Accelerated Emergency Response for Vulnerable Populations (6.1)

2. Discuss any new mitigation actions that should be included in update.

Appendix B:

HAZUS Report





RiskMAP
Increasing Resilience Together

Hazus: Earthquake Global Risk Report

Region Name: Pomona

Earthquake Scenario: M6.7-San Jose v10

Print Date: May 28, 2021

Disclaimer:
This version of Hazus utilizes 2010 Census Data
Totals only reflect data for those census tracts/blocks included in the user's study region

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

HAZUS

FEMA

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General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 21.91 square miles and contains 30 census tracts. There are over 38 thousand households in the region which has a total population of 150,389 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 33 thousand buildings in the region with a total building replacement value (excluding contents) of 12,985 (millions of dollars). Approximately 93.00 % of the buildings (and 75.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,147 and 562 (millions of dollars), respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 33 thousand buildings in the region which have an aggregate total replacement value of 12,985 (millions of dollars). Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 87% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 555 beds. There are 50 schools, 8 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 6 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,705.00 (millions of dollars). This inventory includes over 108.12 miles of highways, 67 bridges, 1,121.57 miles of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	67	460.9871
	Segments	113	1454.3228
	Tunnels	0	0.0000
			1915.3099
Railways	Bridges	7	40.0448
	Facilities	2	5.3260
	Segments	64	114.5125
	Tunnels	0	0.0000
			159.8833
Light Rail	Bridges	0	0.0000
	Facilities	2	7.3224
	Segments	4	50.5316
	Tunnels	0	0.0000
			57.8540
Bus	Facilities	0	0.0000
			0.0000
Ferry	Facilities	0	0.0000
			0.0000
Port	Facilities	0	0.0000
			0.0000
Airport	Facilities	1	14.4161
	Runways	0	0.0000
			14.4161
			2,147.50

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	16.0546
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**16.0546**
Waste Water	Distribution Lines	NA	10.8328
	Facilities	2	327.2234
	Pipelines	0	0.0000
		Subtotal	**338.0562**
Natural Gas	Distribution Lines	NA	7.2218
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**7.2218**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	199.0800
		Subtotal	**199.0800**
Communication	Facilities	0	0.0000
		Subtotal	**0.0000**
		Total	**562.40**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	M6.7-San Jose v10
Type of Earthquake	
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	0.00
Latitude of Epicenter	0.00
Earthquake Magnitude	6.66
Depth (km)	0.00
Rupture Length (Km)	0.00
Rupture Orientation (degrees)	0.00
Attenuation Function	

Direct Earthquake Damage

Building Damage

Hazus estimates that about 11,492 buildings will be at least moderately damaged. This is over 34.00 % of the buildings in the region. There are an estimated 869 buildings that will be damaged beyond repair. The definition of the damage states is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

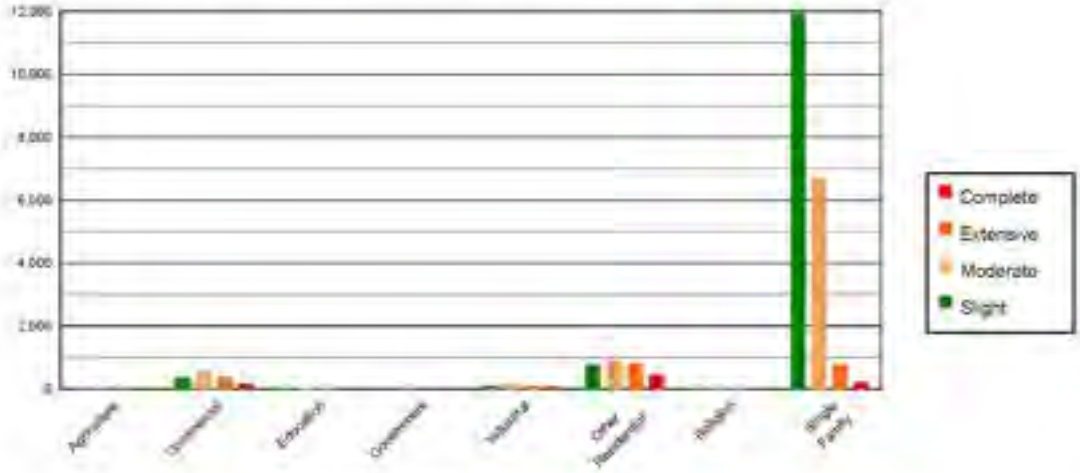


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	7.28	0.06	10.73	0.08	11.67	0.14	6.10	0.29	3.01	0.33
Commercial	238.88	2.77	360.95	2.73	566.49	6.67	365.56	17.39	162.91	18.10
Education	18.99	0.22	24.78	0.19	27.19	0.32	13.38	0.64	4.66	0.52
Government	2.37	0.03	3.52	0.03	5.50	0.06	3.86	0.18	1.75	0.19
Industrial	60.74	0.71	83.69	0.71	164.91	1.94	113.17	5.38	54.19	6.02
Other Residential	452.06	5.25	768.73	5.81	925.52	10.90	798.66	38.00	447.04	49.68
Religion	34.94	0.39	35.75	0.27	44.41	0.52	27.58	1.31	12.32	1.37
Single Family	7807.31	90.65	11926.17	90.16	6745.15	79.44	773.37	36.80	213.89	23.78
Total	8,613		13,225		8,491		2,102		900	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	8205.55	95.27	12605.14	95.32	7130.26	83.97	800.43	38.09	231.46	25.72
Steel	62.62	0.73	90.96	0.69	200.70	2.36	155.27	7.39	68.88	7.65
Concrete	80.75	0.94	130.03	0.98	164.70	1.94	111.84	5.32	50.49	5.61
Precast	52.55	0.61	87.55	0.66	179.38	2.11	126.32	6.01	55.88	6.21
RM	181.73	2.11	176.17	1.33	292.93	3.45	197.65	9.40	59.08	6.57
URM	10.74	0.12	22.89	0.17	48.54	0.57	39.45	1.88	35.66	3.96
MH	18.73	0.22	111.89	0.85	474.64	5.59	670.72	31.91	398.41	44.27
Total	8,613		13,225		8,491		2,102		900	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 555 hospital beds available for use. On the day of the earthquake, the model estimates that only 59 hospital beds (11.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 26.00% of the beds will be back in service. By 30 days, 63.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	3	3	0	0
Schools	50	43	0	0
EOCs	1	1	0	0
PoliceStations	2	2	0	0
FireStations	8	8	0	0

Transportation Lifeline Damage



Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	113	0	0	113	113
	Bridges	67	5	0	62	65
	Tunnels	0	0	0	0	0
Railways	Segments	64	0	0	64	64
	Bridges	7	0	0	7	7
	Tunnels	0	0	0	0	0
	Facilities	2	2	0	2	2
Light Rail	Segments	4	0	0	3	3
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	2	2	0	2	2
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	1	0	1	1
	Runways	0	0	0	0	0

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 % After Day 1	with Functionality > 50 % After Day 7
Potable Water	0	0	0	0	0
Waste Water	2	2	0	0	2
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	1	0	0	1
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	581	520	130
Waste Water	337	261	66
Natural Gas	224	89	22
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	38,360	21,882	10,734	0	0	0
Electric Power		21,680	12,759	4,889	881	31

Induced Earthquake Damage

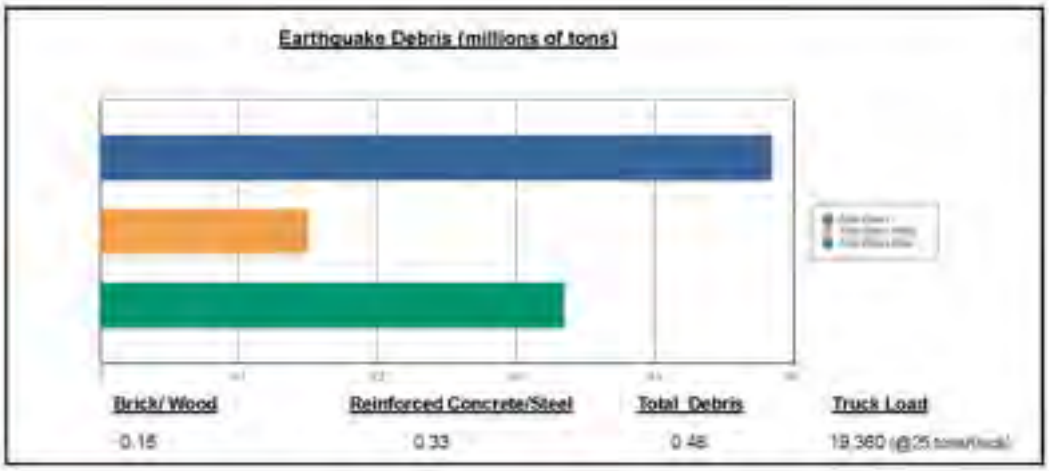
Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 3 ignitions that will burn about 0.04 sq. mi.(0.16 % of the region's total area.) The model also estimates that the fires will displace about 506 people and burn about 31 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 484,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 31.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 19,360 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

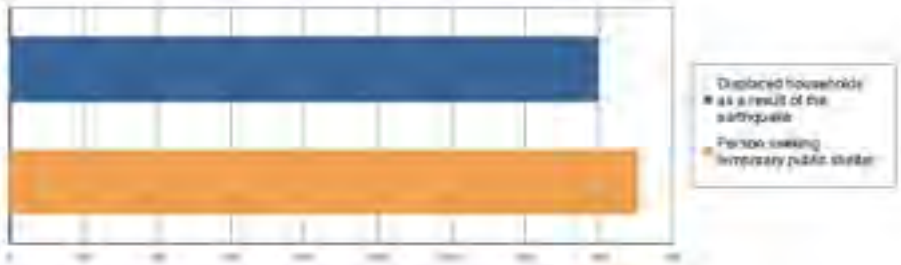


Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1,599 households to be displaced due to the earthquake. Of these, 1,709 people (out of a total population of 150,369) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
1,599	1,709

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows:

Severity Level 1:	Injuries will require medical attention but hospitalization is not needed.
Severity Level 2:	Injuries will require hospitalization but are not considered life-threatening.
Severity Level 3:	Injuries will require hospitalization and can become life threatening if not promptly treated.
Severity Level 4:	Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake.

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	10.80	3.03	0.49	0.96
	Commuting	0.03	0.07	0.05	0.02
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	20.04	5.48	0.83	1.64
	Other-Residential	221.85	53.32	6.12	11.60
	Single Family	165.69	24.49	1.21	2.10
	Total	**418**	**86**	**9**	**16**
2 PM	Commercial	640.02	179.18	29.92	56.83
	Commuting	0.30	0.59	0.76	0.16
	Educational	239.88	65.88	10.65	20.83
	Hotels	0.00	0.00	0.00	0.00
	Industrial	147.67	40.29	6.16	11.99
	Other-Residential	48.69	11.75	1.39	2.56
	Single Family	35.67	5.36	0.31	0.46
	Total	**1,112**	**303**	**48**	**93**
5 PM	Commercial	458.61	128.01	20.72	40.22
	Commuting	4.67	9.41	12.03	2.62
	Educational	23.33	6.44	1.05	2.05
	Hotels	0.00	0.00	0.00	0.00
	Industrial	92.29	25.18	3.85	7.49
	Other-Residential	83.22	20.07	2.37	4.38
	Single Family	64.27	9.60	0.56	0.81
	Total	**726**	**199**	**41**	**57**



HAZUS

FEMA

Economic Loss

The total economic loss estimated for the earthquake is 2,487.94 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Earthquake Global Risk Report

Page 17 of 22

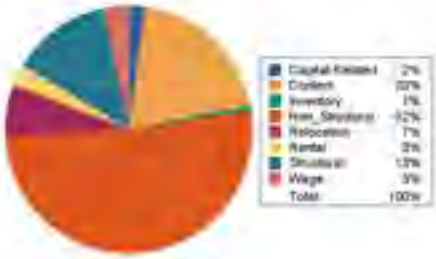
HAZUS FEMA

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business-interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 2,278.18 (millions of dollars); 15 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 51 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

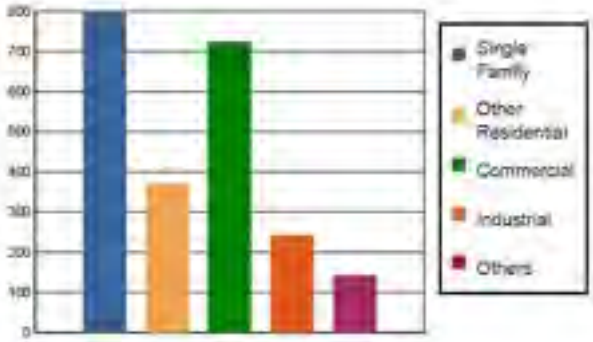


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	4.0557	66.2671	4.1600	3.4403	77.9231
	Capital-Related	0.0000	1.7220	47.3150	2.5948	1.3086	52.9414
	Rental	15.9428	17.0835	28.5176	1.5857	1.9733	65.1029
	Relocation	58.1384	14.7344	50.3301	7.3132	18.5282	148.0443
	Subtotal	**74.0812**	**37.5956**	**192.4308**	**15.6537**	**25.2504**	**345.0117**
Capital Stock Losses							
	Structural	96.9492	44.8101	105.5313	31.5651	16.9752	296.8539
	Non_Structural	460.5309	234.2282	284.3100	109.6361	67.8937	1,176.5989
	Content	147.7758	54.2318	137.6300	73.6736	32.4963	445.8075
	Inventory	0.0000	0.0000	4.2228	10.7916	0.0960	15.1107
	Subtotal	**725.2559**	**333.0701**	**531.6939**	**225.6864**	**117.4647**	**1933.1710**
	Total	**799.34**	**370.67**	**724.12**	**241.34**	**142.72**	**2278.18**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown of the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1454.3226	0.0000	0.00
	Bridges	460.9871	32.2888	7.00
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1915.3099**	**32.2888**	
Railways	Segments	114.5125	0.0000	0.00
	Bridges	40.0448	2.8890	7.21
	Tunnels	0.0000	0.0000	0.00
	Facilities	5.3260	2.2704	42.63
	Subtotal	**159.8833**	**5.1594**	
Light Rail	Segments	50.5316	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	7.3224	3.1301	42.75
	Subtotal	**57.8540**	**3.1301**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	14.4161	5.7830	40.11
	Runways	0.0000	0.0000	0.00
	Subtotal	**14.4161**	**5.7830**	
	Total	**2,147.46**	**46.36**	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	18.0546	2.3395	12.96
	[illegible]	**18.0546**	**2.3395**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	327.2234	98.0345	29.96
	Distribution Lines	10.8328	1.1752	10.85
	[illegible]	**338.0562**	**99.2097**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	7.2218	0.4026	5.57
	[illegible]	**7.2218**	**0.4026**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	[illegible]	**0.0000**	**0.0000**	
Electrical Power	Facilities	199.0800	61.4431	30.86
	[illegible]	**199.0800**	**61.4431**	
Communication	Facilities	0.0000	0.0000	0.00
	[illegible]	**0.0000**	**0.0000**	
	[illegible]	**562.41**	**163.39**	





Appendix A: County Listing for the Region

Los Angeles,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California	Los Angeles	150,389	9,731	3,254	12,985
Total Region		150,389	9,731	3,254	12,985

Appendix C:

Resource Directory &

Pomona Organizational Charts

APPENDIX C: RESOURCE DIRECTORY

The Resource Directory, provided by the Disaster Management Area D Coordinator, provides contact information for local, regional, state, and federal programs that are currently involved in hazard mitigation activities. The Hazard Mitigation Action Committee may refer to the organizations on the following pages for resources and technical assistance. The Resource Directory provides a foundation for potential partners in action item implementation.

American Public Works Association

Level: National
Hazard: Multi
http://www.apwa.net
2345 Grand Boulevard, Suite 500, Kansas City, MO 64108-2641
Ph: 816.472.1610

Notes: The American Public Works Association is an international educational and professional association of public agencies, private sector companies, and individuals dedicated to providing high quality public works goods and services.

Association of State Floodplain Manager

Level: Federal
Hazard: Flood
www.floods.org
2809 Fish Hatchery Road, Madison WI 53713
Ph: 608.274.0123

Notes: The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery

Building Seismic Safety Council (BSSC)

Level: National
Hazard: Earthquake
www.bssconline.org
1090 Vermont Avenue NW, Suite 700, Washington DC, 20005
Ph: 202.289.7800

Notes: The Building Seismic Safety Council (BSSC) develops and promotes building earthquake risk mitigation regulatory provisions for the nation.

California Department of Transportation (Cal-Trans)

Level: State
Hazard: Multi
http://www.dot.ca.gov/
120 S. Spring Street, Los Angeles, CA 90012
Ph: 213.897.3656

Notes: CalTrans is responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries. Alone and in partnership with Amtrak, Caltrans is also involved in the support of intercity passenger rail service in California.

California Resources Agency

Level: State
Hazard: Multi
http://resources.ca.gov/
1416 Ninth Street, Suite 1331, Sacramento, CA 95814
Ph: 916.653.5656

Notes: The California Resources Agency restores, protects and manages the state's natural, historical and cultural resources for current and future generations using solutions based on science, collaboration and respect for all the communities and interests involved.

California Division of Forestry (CDF)

Level: State
Hazard: Multi
http://www.fire.ca.gov/php/index.php
210 W. San Jacinto, Perris, CA 92570
Ph: 909.940.6900

Notes: The California Department of Forestry and Fire Protection protects over 31 million acres of California's privately-owned wildlands. CDF emphasizes the management and protection of California's natural resources.

California Division of Mines and Geology (DMG)

Level: State
Hazard: Multi
www.consrv.ca.gov/cgs/index.htm
801 K Street, MS 12-30, Sacramento, CA 95814
Ph: 916.445.1825

Notes: The California Geological Survey devel-ops and disseminates technical information and advice on California's geology, geologic hazards, and mineral resources.

California Environmental Resources Evaluation System (CERES)

Level: State
Hazard: Multi
http://ceres.ca.gov/
900 N. Street, Suite 250, Sacramento, CA 95814
Ph: 916.653.2238

Notes: CERES is an excellent website for access to environmental information and websites.

California Department of Water Resources (DWR)

Level: State
Hazard: Flood
http://www.dwr.water.ca.gov
1416 9th Street, Sacramento, CA 95814

Ph: 916.653.6192

Notes: The Department of Water Resources manages the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

California Department of Conservation: Southern California Regional Office

Level: State
Hazard: Multi
www.consrv.ca.gov
655 S. Hope Street, #700, Los Angeles, CA 90017-2321
Ph: 213.239.0878

Notes: The Department of Conservation provides services and information that promote environmental health, economic vitality, informed land-use decisions and sound management of our state's natural resources.

EPA, Region 9

Level: Regional
Hazard: Multi
http://epa.gov/region09
75 Hawthorne Street, San Francisco, CA 94105
Ph: 415.947.8000

Notes: The mission of the U.S. Environmental Protection Agency is to protect human health and to safeguard the natural environment through the themes of air and global climate change, water, land, communities and ecosystems, and compliance and environmental stewardship.

Federal Emergency Management Agency, Region IX

Level: Federal
Hazard: Multi
www.fema.gov
1111 Broadway, Suite 1200, Oakland, CA 94607
Ph: 510.627.7100

Notes: The Federal Emergency Management Agency is tasked with responding to, planning for, recovering from and mitigating against disasters.

Federal Emergency Management Agency, Mitigation Division

Level: Federal
Hazard: Multi
www.fema.gov/fima/planhowto.shtm
500 C. Street, SQ, Washington, DC 20472
Ph: 202.566.1600

Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance, Prevention, with mitigation measures and Partnerships, with communities throughout the country.

Floodplain Management Association

Level: Federal
Hazard: Flood
www.floodplain.org
P.O. Box 50891, Sparks, NV 89435-0891
Ph: 775.626.6389

Notes: The Floodplain Management Association is a nonprofit educational association. It was established in 1990 to promote the reduction of flood losses and to encourage the protection and enhancement of natural floodplain values. Members include representatives of federal, state and local government agencies as well as private firms.

Gateway Cities Partnership

Level: Regional
Hazard: Multi
www.gatewaycities.org
7300 Alondra Blvd., Suite 202, Paramount, CA 90723
Ph: 562.817.0820

Notes: Gateway Cities Partnership is a 501-C3 non-profit Community Development Corporation for the Gateway Cities region of southeast LA County. The region comprises 27 cities that roughly speaking extends from Montebello on the north to Long Beach on the South, the Alameda Corridor on the west to the Orange County line on the east.

Governor's Office of Emergency Services (OES)

Level: State
Hazard: Multi
www .oes.ca.gov
P.O. Box 419047, Rancho Cordova, CA 95741-9047
Ph: 916.845.8911

Notes: The Governor's Office of Emergency Services coordinates overall state agency response to major disasters in support of local government. The office is responsible for assuring the state's readiness to respond to and recover from natural, manmade, and war-caused emergencies, and for assisting local governments in their emergency preparedness, response and recovery efforts.

Governor's Office of Planning and Research

Level: State
Hazard: Multi
https://www.opr.ca.gov/about/contact-us.html
1400 Tenth Street, Sacramento, CA 95814
Ph: 916.322.2318

Notes: The Governor's Office of Planning and Research studies future research and planning needs, fosters goal-driven collaboration, and delivers guidance to state partners and local communities, with a focus on land use and community development, climate risk and resilience, and high road economic development.

Landslide Hazards Program, USGS

Level: Federal
Hazard: Landslide
http:// lands I ides.usgs.gov/index.htmI

12201 Sunrise Valley Drive, Reston, VA 20192
Ph: 703.648.4000

Notes: The NLIC website provides good information on the rograms and resources regarding landslides. The page includes information on the National Landslide Hazards Program Information Center, a bibliography, publications, and current projects. USGS scientists are working to reduce long-term losses and casualties from landslide hazards through better understanding of the causes and mechanisms of ground failure both nationally and worldwide.

Los Angeles County Economic Development Corporation

Level: Regional
Hazard: Multi
www.laedc.org
444 S. Flower Street, Los Angeles, CA 90071
Ph: 213.236.4813

Notes: The LAEDC is a private, non-profit 501 (c) 3 organization established in 1981 with the mission to attract, retain and grow businesses and jobs in the Los Angeles region. The LAEDC is widely relied upon for its Southern California Economic Forecasts and Industry Trend Reports. Lead by the renowned Jack Kyser (Sr. Vice President, Chief Economist) his team of re-searchers produces numerous publications to help business, media and government navigate the LA region's diverse economy.

Los Angeles County Public Works Department

Level: County
Hazard: Multi
http://ladpw.org
900 S. Fremont Ave., Alhambra, CA 91803
Ph: 626.458.5100

Notes: The Los Angeles County Department of Public Works protects property and promotes public safety through Flood Control, Water Conservation, Road Maintenance, Bridges, Buses and Bicycle Trails, Building and Safety, Land Development, Waterworks, Sewers, Engineering, Capital Projects and Airports.

National Wildland/Urban Interface Fire Program

Level: Federal
Hazard: Wildfire
www.firewise.org/
1 Batterymarch Park, Quincy, MA 02169-7471
Ph: 617.770.3000

Notes: Firewise maintains a Website designed for people who live in wildfire-prone areas, but it also can be of use to local planners and decision makers. The site offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences.

National Resources Conservation Service

Level: Federal
Hazard: Multi
http://www.nrcs.usda.gov/
14th and Independ-ence Ave., SW, Washington, DC 20250
Ph: 202.720.7246

Notes: NRCS assists owners of America's private land with conserving their soil, water, and other natural resources, by delivering technical assistance based on sound science and suited to a customer's specific needs. Cost shares and financial incentives are available in some cases.

National lnteragency Fire Center (NIFC)

Level: Federal
Hazard: Wildfire
www.nifc.gov
3833 S. Development Ave., Boise, Idaho 83705-5354
Ph: 208.387.5512

Notes: The NIFC in Boise, Idaho is the nation's support center for wildland firefighting. Seven federal agencies work together to coordinate and support wildland fire and disaster operations.

National Fire Protection Association (NFPA)

Level: National

Hazard: Wildfire
http://www.nfpa.org/catalog/home/index.asp
1 Batterymarch Park, Quincy, MA 02 I 69-7471
Ph: 617.770.3000

Notes: The mission of the international non-profit NFPA is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically based consensus codes and standards, research, training and education.

National Floodplain Insurance Program (NFIP)

Level: Federal
Hazard: Flood
www.fema.gov/nfip/
500 C Street, S. W., Washington, O.C. 20472
Ph: 202.566.1600

Notes: The Mitigation Division manages the National Flood Insurance Program and oversees FEMA's mitigation programs. It has of a number of programs and activities of which provide citizens Protection, with flood insurance, Prevention, with mitigation measures and Partnerships, with communities throughout the country.

National Oceanic /Atmospheric Administration

Level: Federal
Hazard: Multi
www.noaa.gov
14th Street & Constitution Ave NW, Washington, DC 20230
Ph: 202.482.6090

Notes: NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship.

National Weather Service, Office of Hydrologic Development

Level: Federal
Hazard: Flood
http://www.nws.noaa.gov/

1325 East West Highway, SSMC2, Silver Spring, MD 20910
Ph: 301.713.1658

Notes: The Office of Hydrologic Development (OHO) enhances National Weather Service products by infusing new hydrologic science, developing hydrologic techniques for operational use, managing hydrologic development by NWS field office, providing advanced hydrologic products to meet needs identified by NWS customers.

National Weather Service

Level: Federal
Hazard: Multi
http://www.nws.noaa.gov/
520 North Elevar Street, Oxnard, CA 93030
Ph: 805.988.6615

Notes: The National Weather Service is responsible for providing weather service to the nation. It is charged with the responsibility of observing and reporting the weather and with issuing forecasts and warnings of weather and floods in the interest of national safety and economy. Briefly, the priorities for service to the nation are: 1. protection of life, 2. protection of property, and 3. promotion of the nation's welfare and economy.

San Gabriel Valley Economic Partnership

Level: Regional
Hazard: Multi
www.valleynet.org
4900 Rivergrade Road, Irwindale, CA 91706
Ph: 626.856.3400

Notes: The San Gabriel Valley Economic Partnership is a non-profit corporation representing both public and private sectors. The Partnership is the exclusive source for San Gabriel Valley specific information, expertise, consulting, products, services, and events. It is the single organization in the Valley with the mission to sustain and build the regional economy for the mutual benefit of all thirty cities, chambers of commerce, academic institutions, businesses, and residents.

Sanitation Districts of Los Angeles County

Level: County
Hazard: Flood
http://www.lacsd.ora/
1955 Workman Mill Road, Whittier, CA 90607
Ph: 562.699.7411 x 2301

Notes: The South Bay Economic Development Partnership is a collaboration of business, labor, education and government. Its primary goal is to plan and implement an economic development and marketing strategy designed to retain and create jobs and stimulate economic growth in the South Bay of Los Angeles County.

South Coast Air Quality Management District (AQMD)

Level: Regional
Hazard: Multi
www.aqmd.gov
21865 E. Copley Drive, Diamond Bar, CA 91765
Ph: 800.CUT.SMOG

Notes: AQMD is a regional government agency that seeks to achieve and maintain healthful air quality through a comprehensive program of research, regulations, enforcement, and communication. The AQMD covers Los Angeles and Orange Counties and parts of Riverside and San Bernardino Counties.

Southern California Earthquake Center (SCEC)

Level: Regional
Hazard: Earthquake
www.scec.org
3651 Trousdale Parkway, Suite 169, Los Angeles, CA 90089-0742
Ph: 213.740.5843

Notes: The Southern California Earthquake Center (SCEC) gathers new information about earthquakes in Southern California, integrates this information into a comprehensive and predictive understanding of earthquake phenomena, and communicates this understanding to end-users and the general public in order to increase earthquake awareness, reduce economic losses, and save lives.

Southern California Association of Governments (SCAG)

Level: Regional
Hazard: Multi
www.scag.ca.gov
818 W. Seventh Street, 12th floor, Los Angeles, CA 90017
Ph: 213.236.1800

Notes: The Southern California Association of Governments functions as the Metropolitan Planning Organization for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura and Imperial. As the designated Metropolitan Planning Organization, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.

State Fire Marshal (SFM)

Level: State
Hazard: Wildfire
http://osfm.fire.ca.gov
1131 "S" Street, Sacramento, CA 95814
Ph: 916.445.8200

Notes: The Office of the State Fire Marshal (SFM) supports the mission of the California Department of Forestry and Fire Protection (CDF) by focusing on fire prevention. SFM regulates buildings in which people live, controls substances which may, cause injuries, death and destruction by fire; provides statewide direction for fire prevention within wildland areas; regulates hazardous liquid pipelines; reviews regulations and building standards; and trains and educates in fire protection methods and responsibilities.

The Community Rating System (CRS)

Level: Federal
Hazard: Flood
http://www.fema.gov/nfip/crs.shtm
500 C Street, S. W., Washington, D.C. 20472
Ph: 202.566.1600

Notes: The Community Rating System (CRS) recognizes community floodplain management efforts that go beyond the minimum requirements of the NFlP. Property owners within the County would receive reduced NFIP flood insurance premiums if the County implements floodplain management practices that qualify it for a CRS rating. For further information on the CRS, visit FEMA's website.

United States Geological Survey

Level: Federal
Hazard: Multi
http://www.usgs.gov/
345 Middlefield Road, Menlo Park, CA 94025
Ph: 650.853.8300

Notes: The USGS provides reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

US Army Corps of Engineers

Level: Federal
Hazard: Multi
http://www.usaace.army.mil
P.O. Box 532711, Los Angeles CA 90053- 2325
Ph: 213.452.3921

Notes: The United States Army Corps of Engineers work in engineering and environmental matters. A workforce of biologists, engineers, geologists, hydrologists, natural resource managers and other professionals provide engineering services to the nation including planning, designing, building and operating water resources and other civil works projects.

USDA Forest Service

Level: Federal
Hazard: Wildfire

http://www.fs.fed.us
1400 Independence Ave. SW, Washington, D.C. 20250-0002
Ph: 202.205.8333

Notes: The Forest Service is an agency of the U.S. Department of Agriculture. The Forest Service manages public lands in national forests and grasslands.

USGS Water Resources

Level: Federal
Hazard: Multi
www.water.usgs.gov
6000 J Street, Sacramento, CA 95819-6129
Ph: 916.278.3000

Notes: The USGS Water Resources mission is to provide water information that benefits the Nation's citizens: publications, data, maps, and applications software.

Western States Seismic Policy Council (WSSPC)

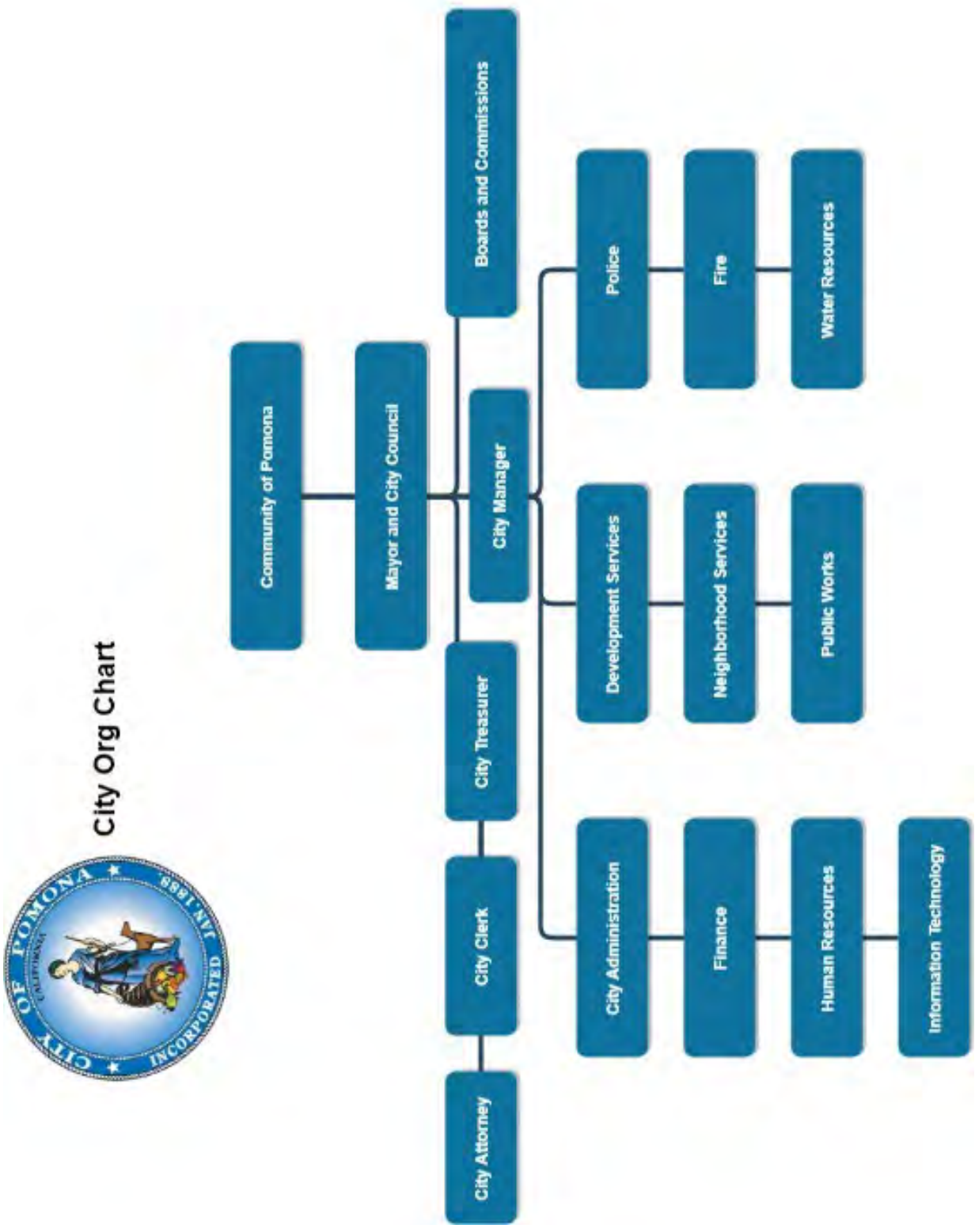
Level: Regional
Hazard: Earthquake
www.wsspc.org/home.html
125 California Avenue, Palo Alto, CA 94306
Ph: 650.330.1101

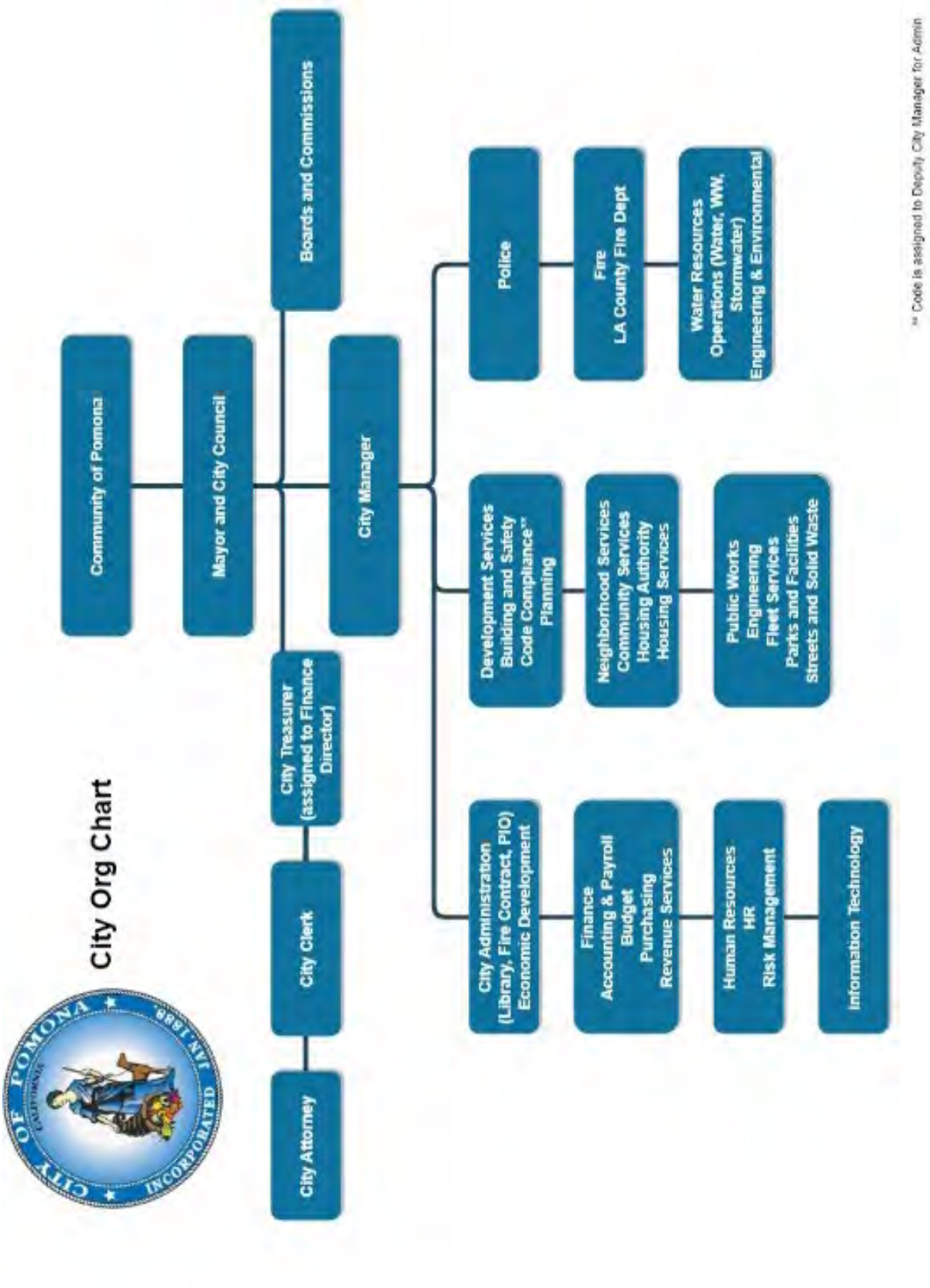
Notes: WSSPC is a regional earthquake consortium funded mainly by FEMA. Its website is a great resource, with information clearly categorized - from policy to engineering to education.

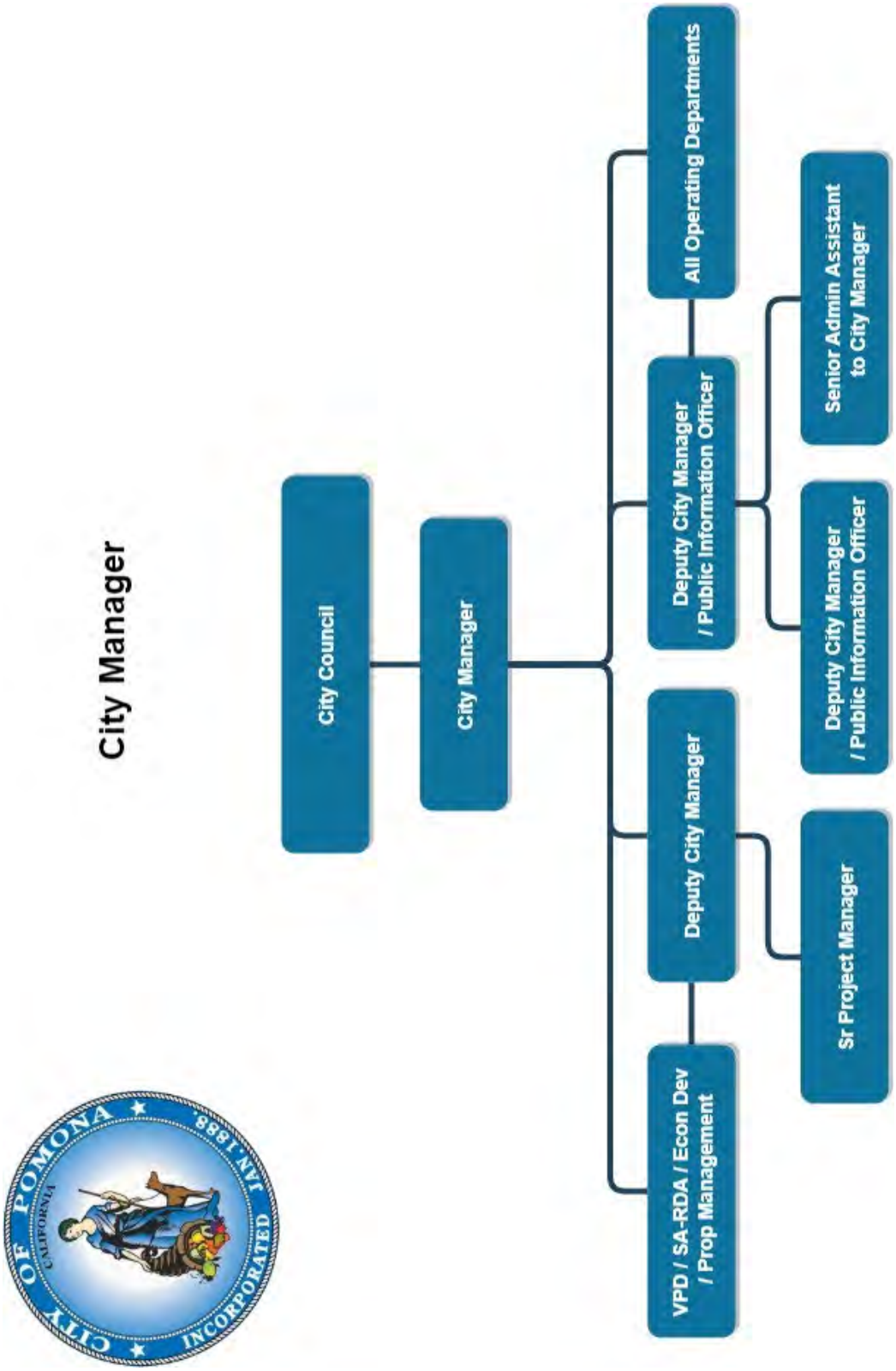
Westside Economic Collaborative C/O Pacific Western Bank

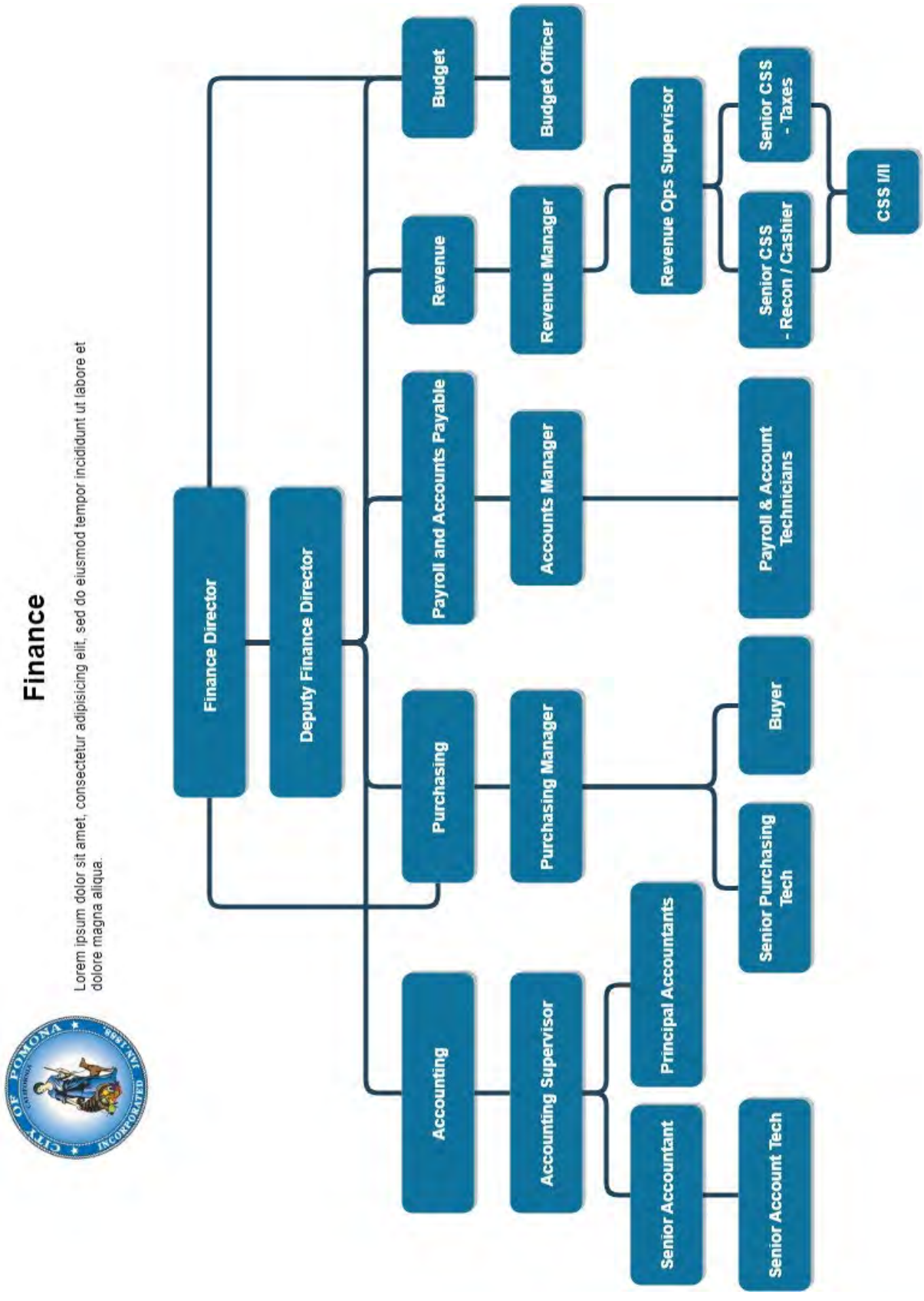
Level: Regional
Hazard: Multi
http://www.westside-la.or
120 Wilshire Boulevard, Santa Monica, CA 90401
Ph: 310.458.1521

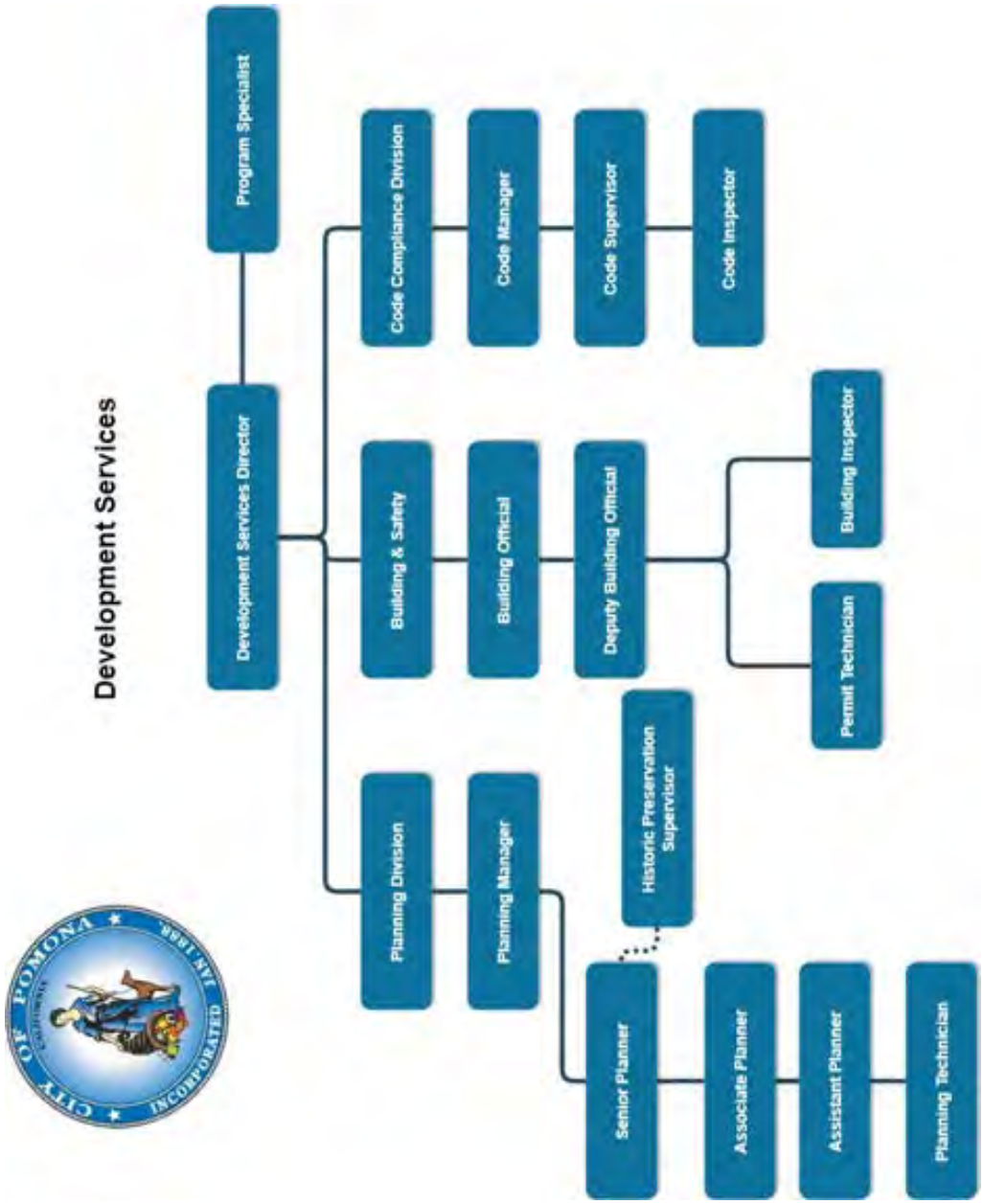
Notes: The Westside Economic Development Collaborative is the first Westside regional economic development corporation. The Westside EDC functions as an information gatherer and resource center, as well as a forum, through bringing business, government, and residents together to address issues affecting the region: Economic Diversity, Transportation, Housing, Workforce Training and Retraining, Lifelong Learning, Tourism, and Embracing Diversity.

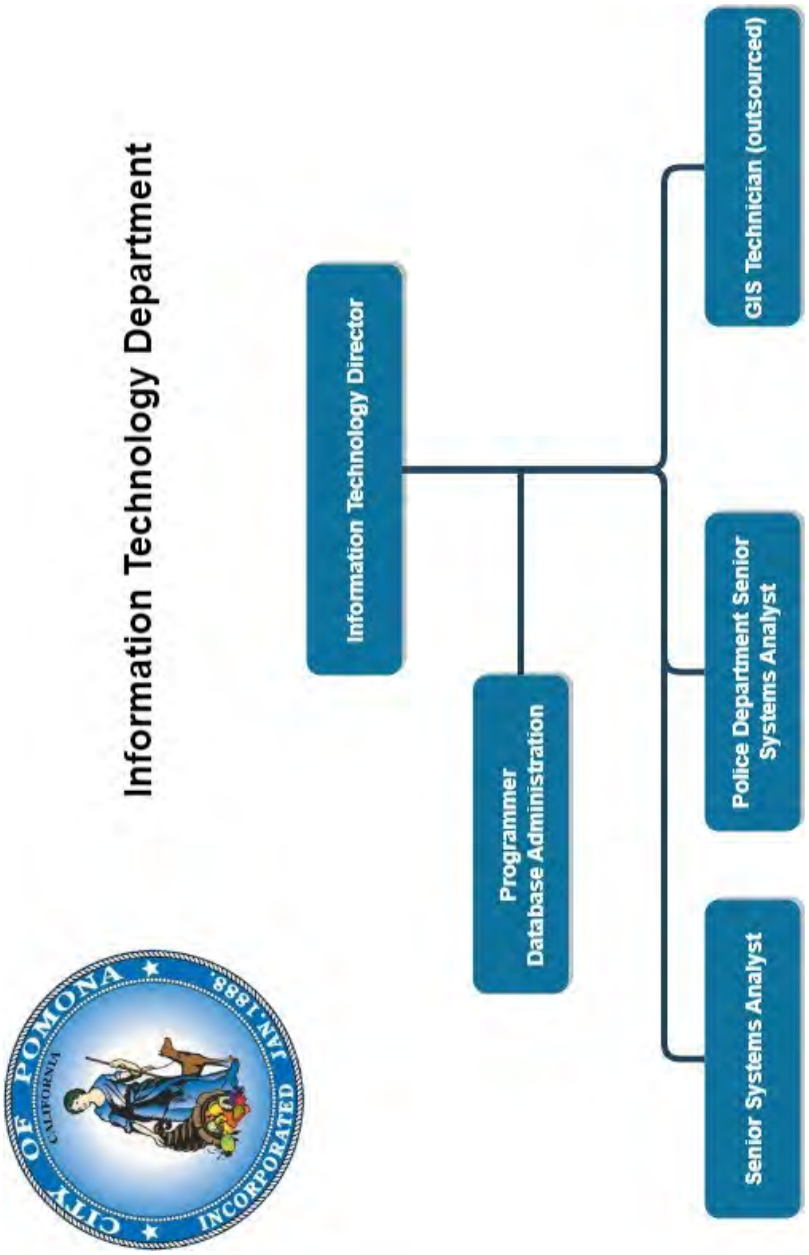

City Org Chart
Community of Pomona
Mayor and City Council
Boards and Commissions
City Manager
City Treasurer
City Clerk
City Attorney
Police
Fire
Water Resources
Development Services
Neighborhood Services
Public Works
City Administration
Finance
Human Resources
Information Technology

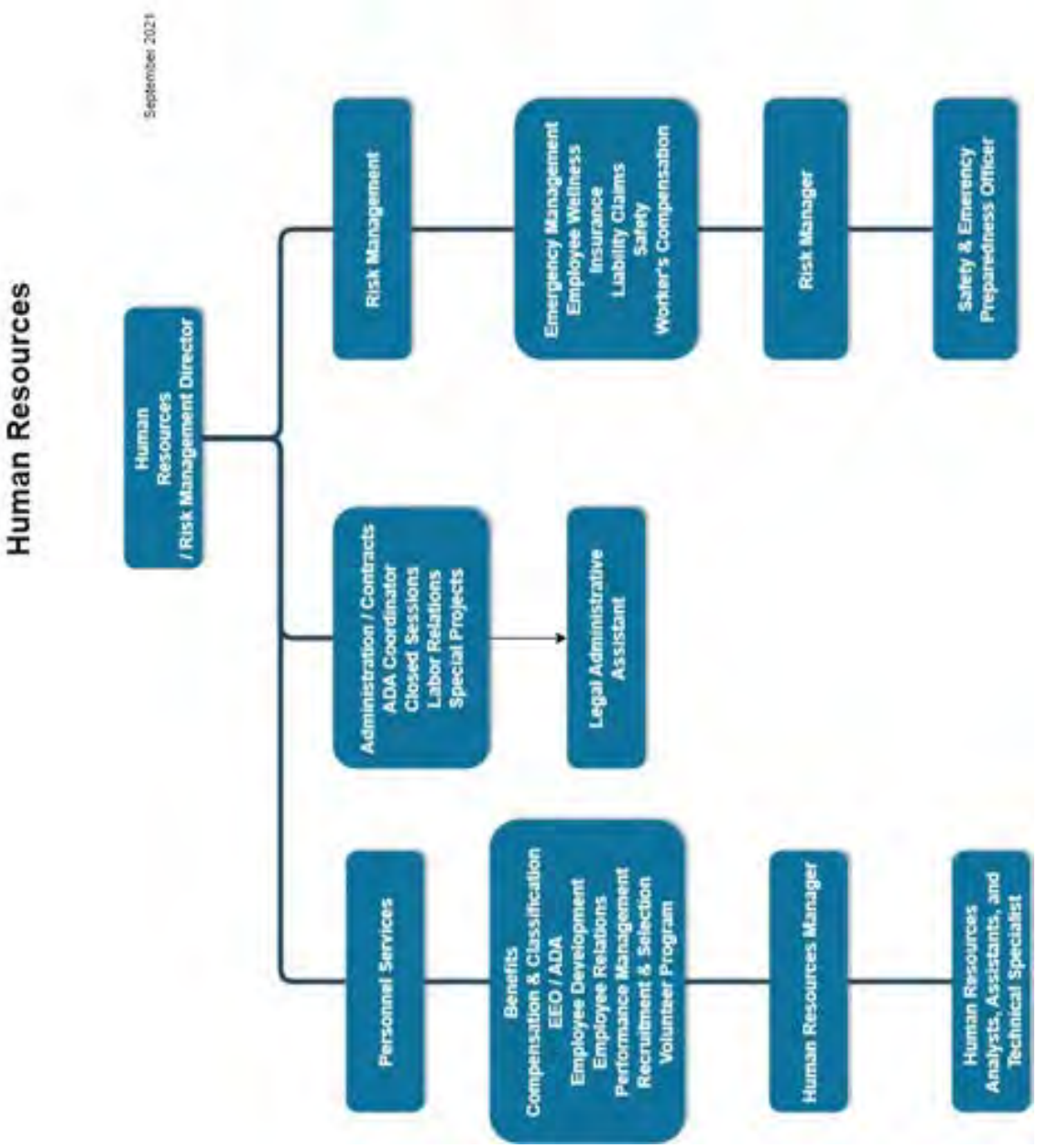

City Org Chart
Community of Pomona
Mayor and City Council
Boards and Commissions
City Manager
City Clerk
City Treasurer (assigned to Finance Director)
City Attorney
City Administration (Library, Fire Contract, PIO) Economic Development
Finance Accounting & Payroll Budget Purchasing Revenue Services
Human Resources HR Risk Management
Information Technology
Development Services Building and Safety Code Compliance** Planning
Neighborhood Services Community Services Housing Authority Housing Services
Public Works Engineering Fleet Services Parks and Facilities Streets and Solid Waste
Police
Fire LA County Fire Dept
Water Resources Operations (Water, WW, Stormwater) Engineering & Environmental
** Code is assigned to Deputy City Manager for Admin

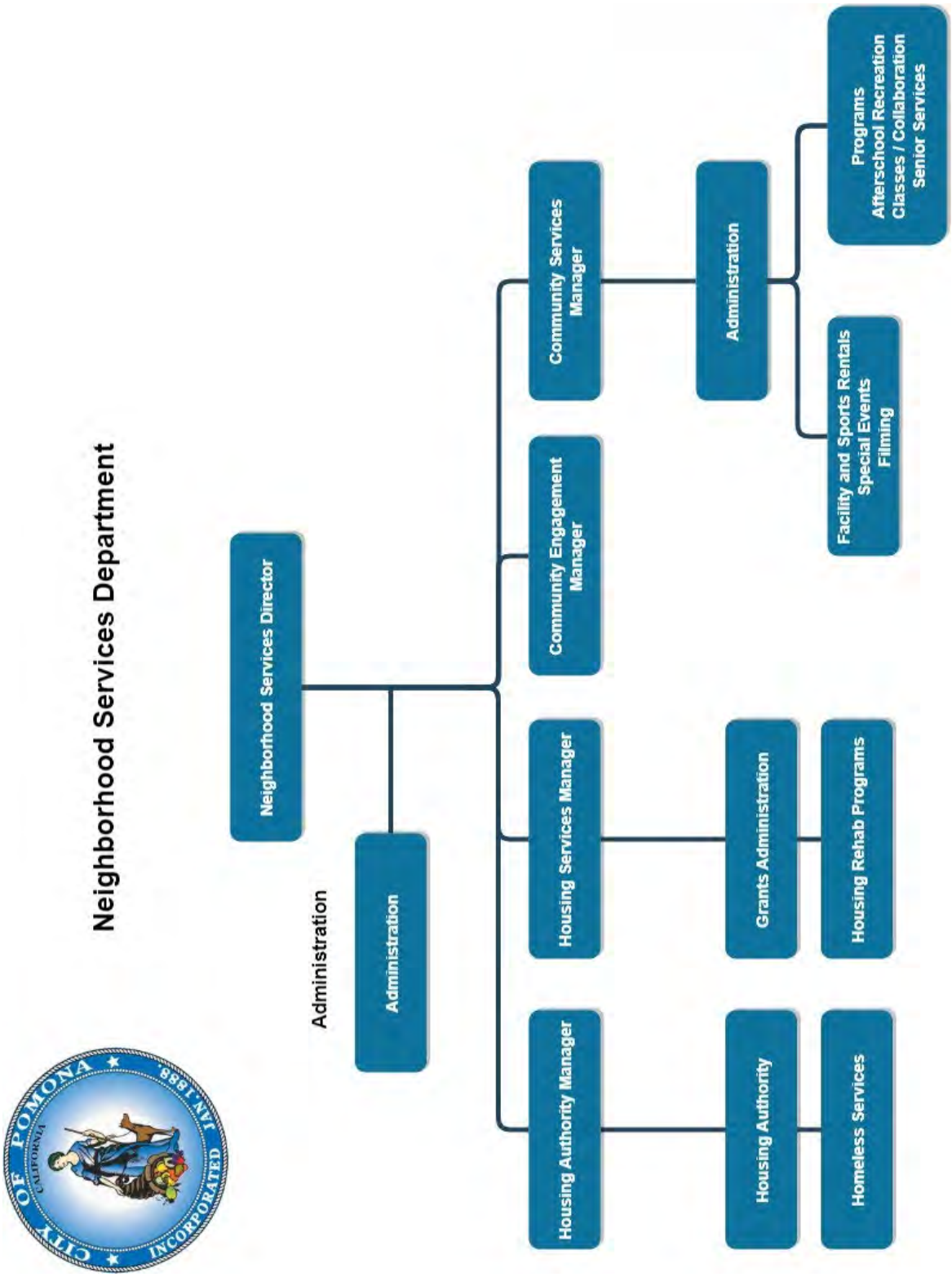

City Manager
City Council
City Manager
All Operating Departments
Deputy City Manager / Public Information Officer
Senior Admin Assistant to City Manager
Deputy City Manager / Public Information Officer
Deputy City Manager
Sr Project Manager
VPD / SA-RDA / Econ Dev / Prop Management


Finance
Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
Finance Director
Deputy Finance Director
Budget
Budget Officer
Revenue
Revenue Manager
Revenue Ops Supervisor
Senior CSS - Taxes
Senior CSS - Recon / Cashier
CSS I/II
Payroll and Accounts Payable
Accounts Manager
Payroll & Account Technicians
Purchasing
Purchasing Manager
Buyer
Senior Purchasing Tech
Accounting
Accounting Supervisor
Principal Accountants
Senior Accountant
Senior Account Tech


Development Services
Program Specialist
Development Services Director
Code Compliance Division
Code Manager
Code Supervisor
Code Inspector
Building & Safety
Building Official
Deputy Building Official
Building Inspector
Permit Technician
Planning Division
Planning Manager
Historic Preservation Supervisor
Senior Planner
Associate Planner
Assistant Planner
Planning Technician

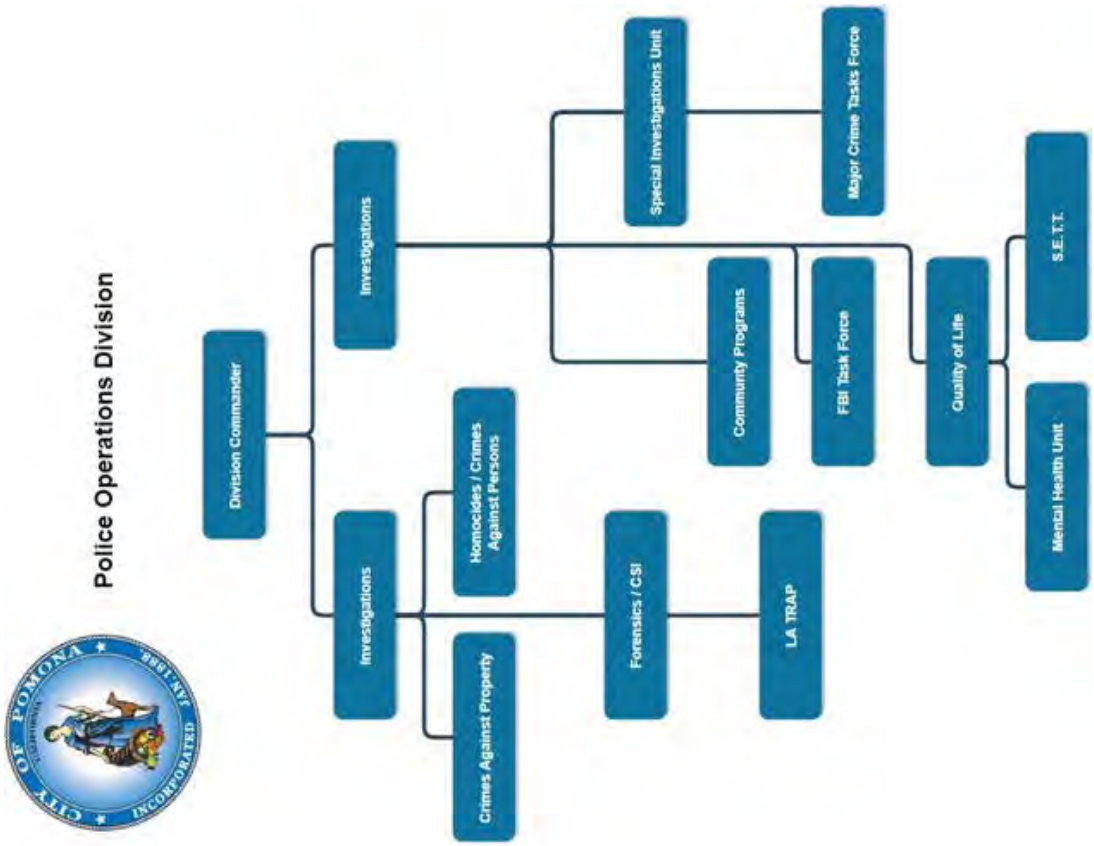

Information Technology Department
Information Technology Director
Programmer
Database Administration
GIS Technician (outsourced)
Police Department Senior
Systems Analyst
Senior Systems Analyst

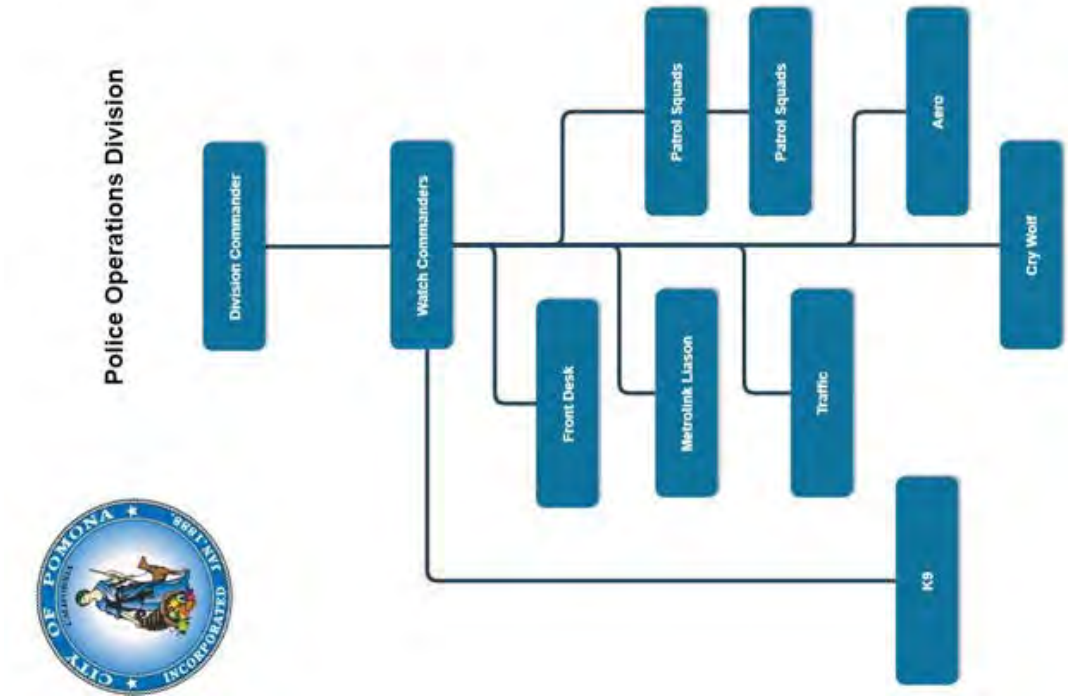

Human Resources
September 2021
Human Resources / Risk Management Director
Risk Management
Emergency Management
Employee Wellness
Insurance
Liability Claims
Safety
Worker's Compensation
Risk Manager
Safety & Emergency Preparedness Officer
Administration / Contracts
ADA Coordinator
Closed Sessions
Labor Relations
Special Projects
Legal Administrative Assistant
Personnel Services
Benefits
Compensation & Classification
EEO / ADA
Employee Development
Employee Relations
Performance Management
Recruitment & Selection
Volunteer Program
Human Resources Manager
Human Resources Analysts, Assistants, and Technical Specialist

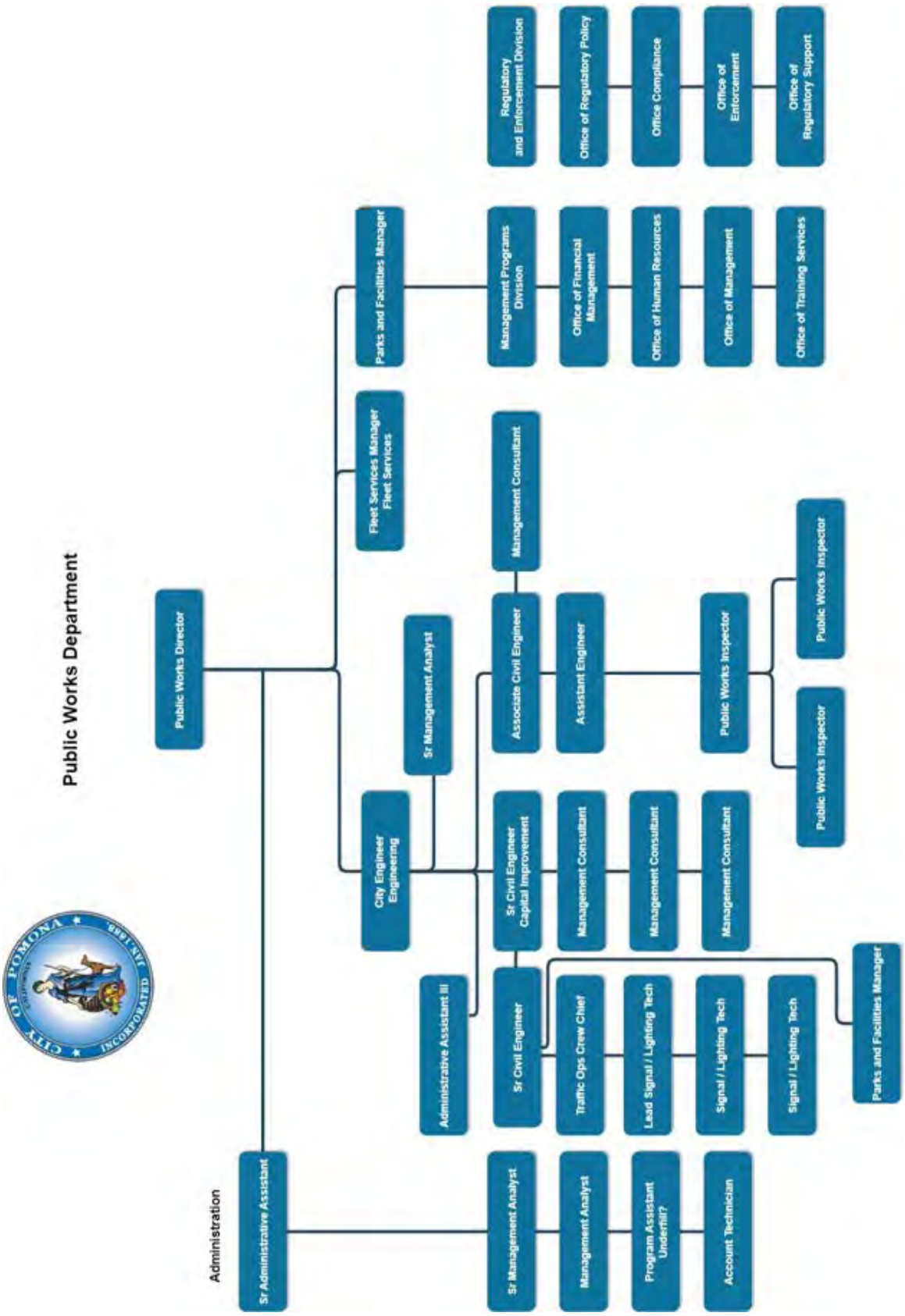

Neighborhood Services Department
Neighborhood Services Director
Administration
Administration
Community Engagement Manager
Community Services Manager
Administration
Programs
Afterschool Recreation
Classes / Collaboration
Senior Services
Facility and Sports Rentals
Special Events
Filming
Housing Services Manager
Grants Administration
Housing Rehab Programs
Housing Authority Manager
Housing Authority
Homeless Services

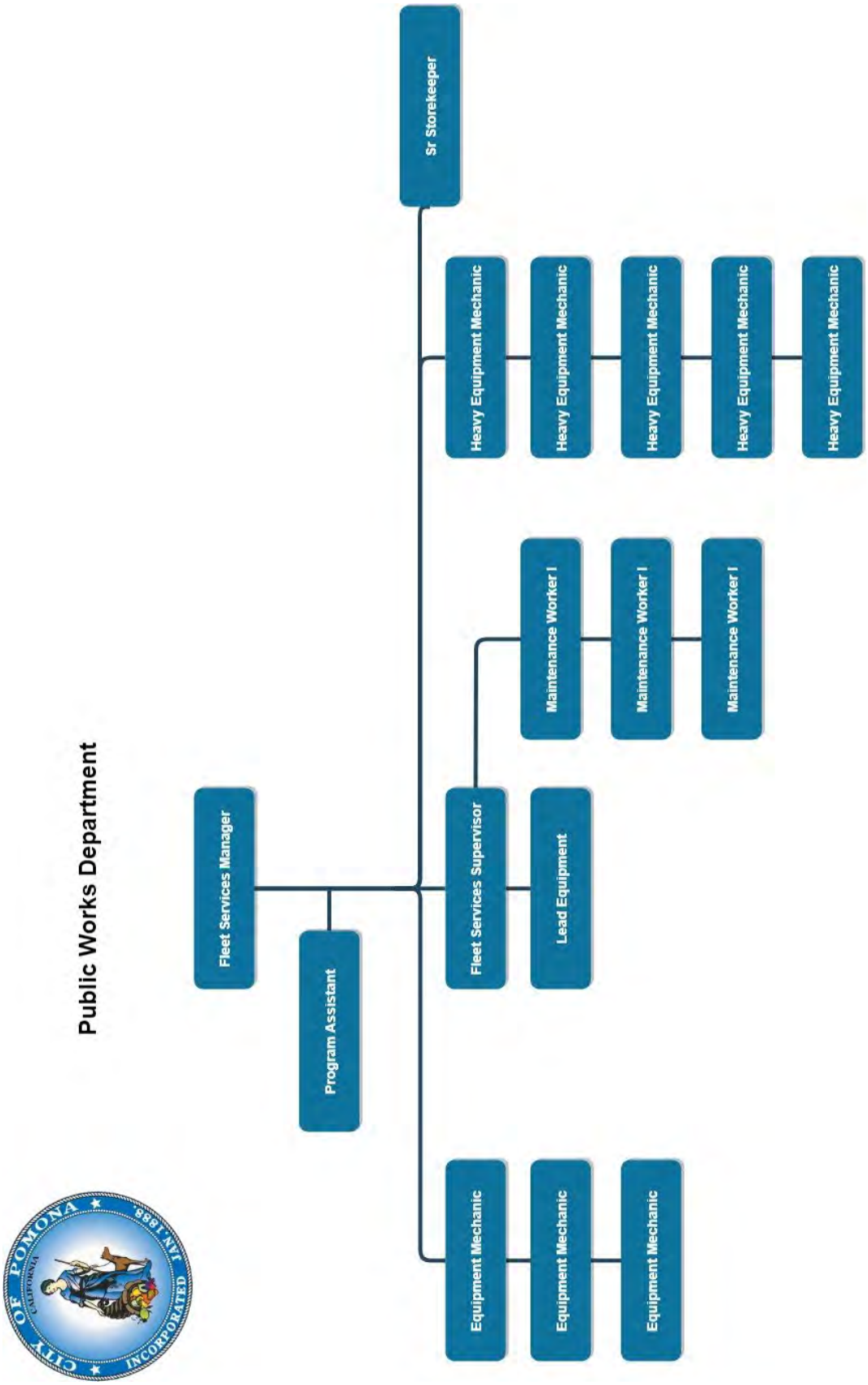

Pomona Police Department
SWAT Commander
Chief of Police
Public Information Specialist
Deputy Chief
Professional Standards
Internal Affairs
Training Bureau
Operations Division
Investigative Services Division
Administrative Services Division

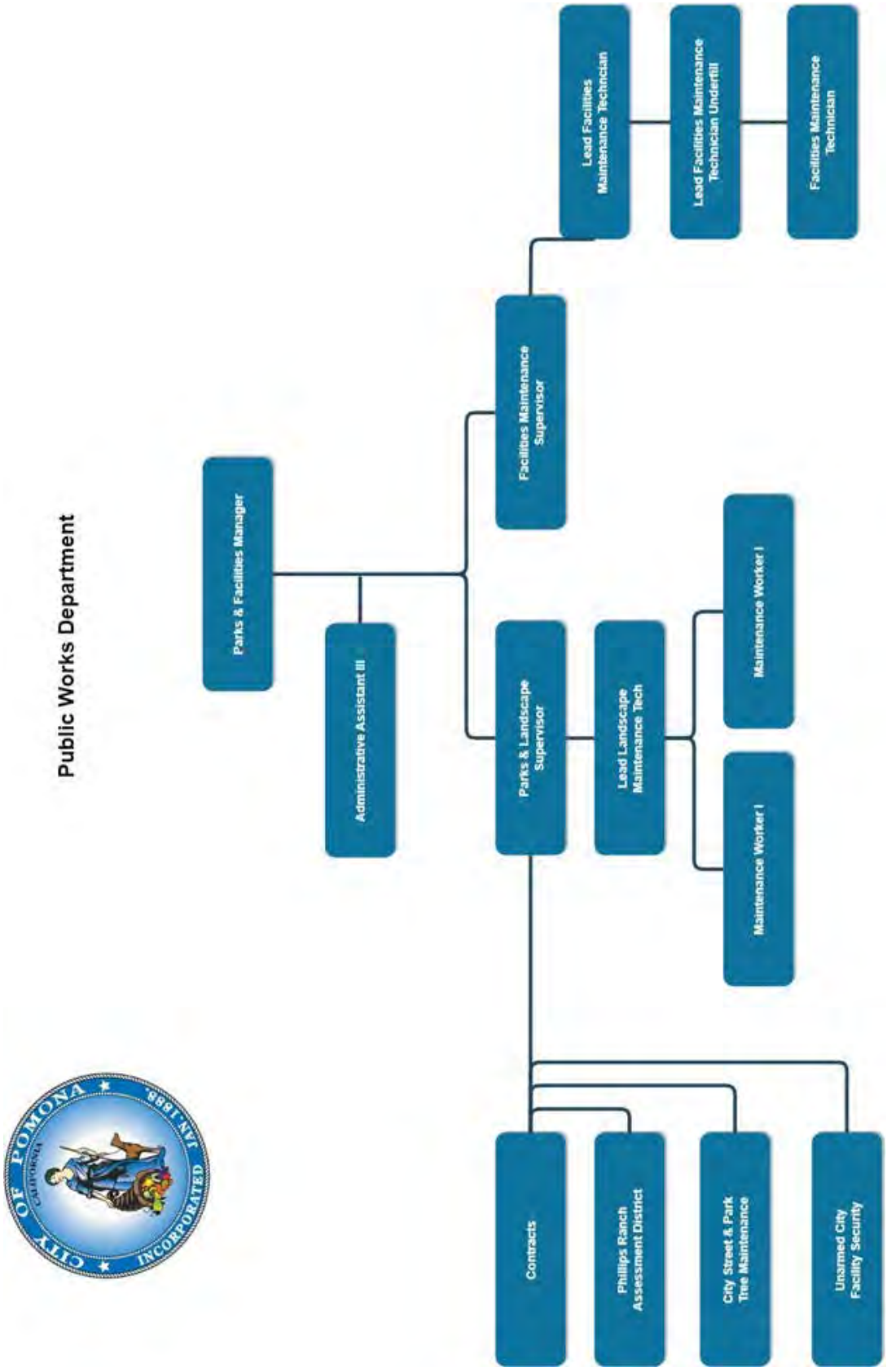

Police Administrative Services Department
Police Civilian Division Commander
Facility Maintenance
Dispatch / Jail / Communication Manager
Police Records Manager
Jail
Communications
Dispatch
Records
Property
Administrative Services Manager
Payroll
Accounting

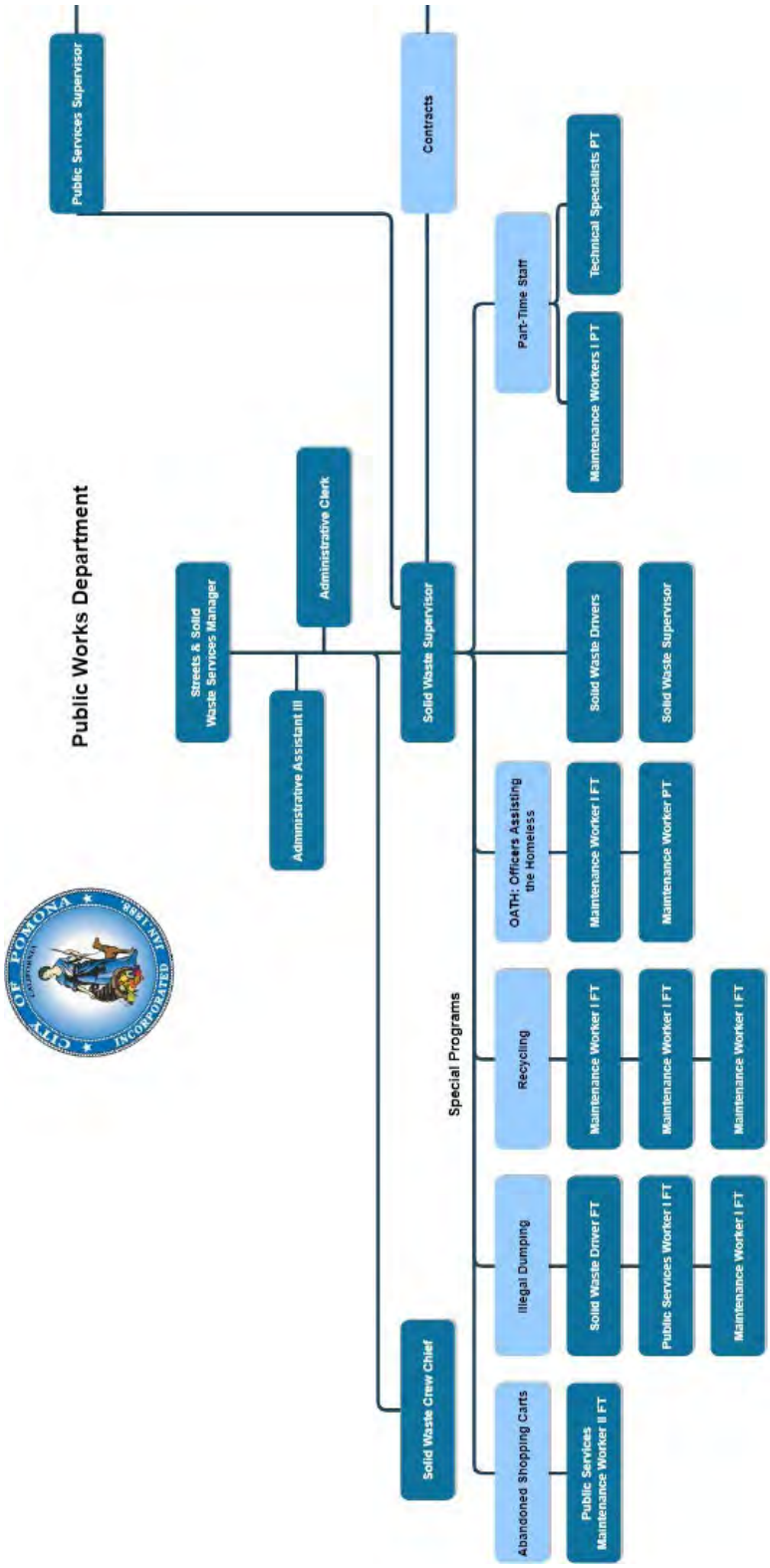

Police Operations Division
Division Commander
Investigations
Special Investigations Unit
Major Crime Tasks Force
Community Programs
FBI Task Force
Quality of Life
S.E.T.T.
Mental Health Unit
Investigations
Homocides / Crimes Against Persons
Crimes Against Property
Forensics / CSI
LA TRAP

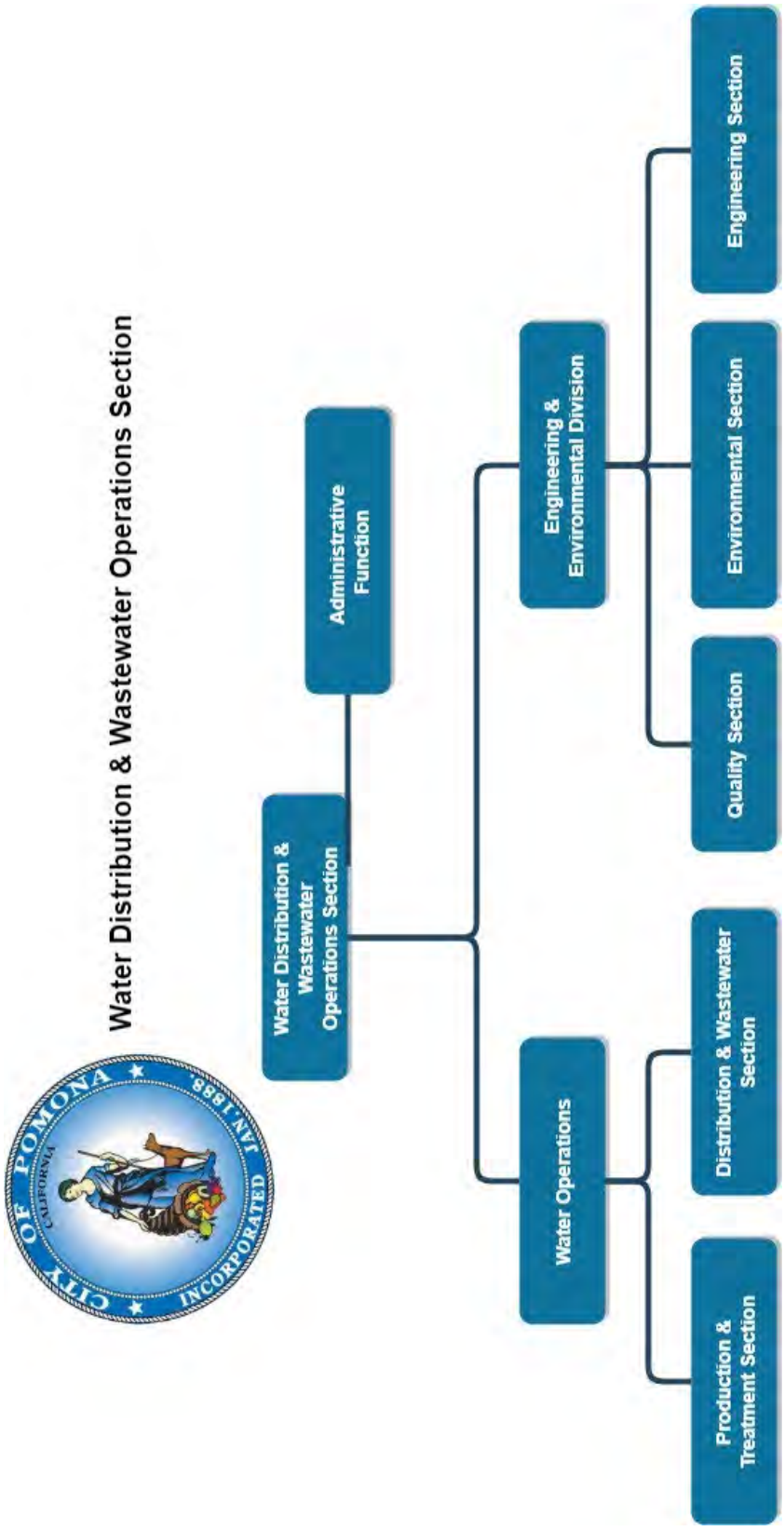

Police Operations Division
Division Commander
Watch Commanders
Patrol Squads
Patrol Squads
Aero
Cry Wolf
Front Desk
Metrolink Liason
Traffic
K9


Public Works Department
Public Works Director
Administration
Sr Administrative Assistant
Sr Management Analyst
Management Analyst
Program Assistant Undermin?
Account Technician
City Engineer Engineering
Sr Management Analyst
Administrative Assistant III
Sr Civil Engineer Capital Improvement
Sr Civil Engineer
Traffic Ops Crew Chief
Lead Signal / Lighting Tech
Signal / Lighting Tech
Signal / Lighting Tech
Management Consultant
Management Consultant
Management Consultant
Management Consultant
Associate Civil Engineer
Assistant Engineer
Public Works Inspector
Public Works Inspector
Public Works Inspector
Parks and Facilities Manager
Fleet Services Manager Fleet Services
Parks and Facilities Manager
Management Programs Division
Office of Financial Management
Office of Human Resources
Office of Management
Office of Training Services
Regulatory and Enforcement Division
Office of Regulatory Policy
Office Compliance
Office of Enforcement
Office of Regulatory Support


Public Works Department
Fleet Services Manager
Program Assistant
Sr Storekeeper
Fleet Services Supervisor
Lead Equipment
Maintenance Worker I
Maintenance Worker I
Maintenance Worker I
Heavy Equipment Mechanic
Heavy Equipment Mechanic
Heavy Equipment Mechanic
Heavy Equipment Mechanic
Heavy Equipment Mechanic
Equipment Mechanic
Equipment Mechanic
Equipment Mechanic


Public Works Department
Parks & Facilities Manager
Administrative Assistant III
Facilities Maintenance Supervisor
Lead Facilities Maintenance Technician
Lead Facilities Maintenance Technician Underfill
Facilities Maintenance Technician
Parks & Landscape Supervisor
Lead Landscape Maintenance Tech
Maintenance Worker I
Maintenance Worker I
Contracts
Phillips Ranch Assessment District
City Street & Park Tree Maintenance
Unarmed City Facility Security


Public Works Department
Public Services Supervisor
Contracts
Streets & Solid Waste Services Manager
Administrative Clerk
Administrative Assistant III
Solid Waste Supervisor
Part-Time Staff
Technical Specialists PT
Maintenance Workers I PT
Solid Waste Drivers
Solid Waste Supervisor
Special Programs
OATH: Officers Assisting the Homeless
Maintenance Worker I FT
Maintenance Worker PT
Recycling
Maintenance Worker I FT
Maintenance Worker I FT
Maintenance Worker I FT
Illegal Dumping
Solid Waste Driver FT
Public Services Worker I FT
Maintenance Worker I FT
Solid Waste Crew Chief
Abandoned Shopping Carts
Public Services Maintenance Worker II FT


Water Distribution & Wastewater Operations Section
Water Distribution & Wastewater Operations Section
Administrative Function
Engineering & Environmental Division
Engineering Section
Environmental Section
Quality Section
Water Operations
Distribution & Wastewater Section
Production & Treatment Section

Appendix D:

Economic Analysis Guidelines for Natural Hazard Mitigation Projects

APPENDIX D: ECONOMIC ANALYSIS GUIDELINES FOR NATURAL HAZARD MITIGATION PROJECTS

Benefit/cost analysis is a key mechanism used by the state Office of Emergency Services (OES), the Federal Emergency Management Agency, and other state and federal agencies in evaluating hazard mitigation projects and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

This appendix outlines several approaches for conducting economic analysis of natural hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: The Interagency Hazards Mitigation Team, State Hazard Mitigation Plan, (Oregon State Police - Office of Emergency Management, 2000), and Federal Emergency Management Agency Publication 331, Report on Costs and Benefits of Natural Hazard Mitigation.

This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to provide the details of economic analysis methods that can be used to evaluate local projects. It is intended to (I) raise benefit/cost analysis as an important issue, and (2) provide some background on how economic analysis can be used to evaluate mitigation projects.

PURPOSE

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred.

Evaluating natural hazard mitigation provides decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools.

Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce "ripple-effects" throughout the community, greatly increasing the disaster's social and economic consequences.

While not easily accomplished, there is value, from a public policy perspective, in assessing the positive and negative impacts from mitigation activities and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various mitigation options would not be based on an objective understanding of the net benefit or loss associated with these actions.

ECONOMIC ANALYSIS APPROACHES FOR MITIGATION STRATEGIES

The approaches used to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. The distinction between the two methods is the way in which the relative costs and benefits are measured. Additionally, there are varying approaches to assessing the value of mitigation for public sector and private sector activities.

Benefit/Cost Analysis

Benefit/cost analysis is used in natural hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoided future damages, and risk.

In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented (i.e., if net benefits exceed net costs, the project is worth pursuing). A project must have a benefit/cost ratio greater than 1 in order to be funded.

Cost-Effectiveness Analysis

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

Investing in public sector mitigation activities

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to evaluate the economic feasibility of public decisions that involve a diverse set of beneficiaries and non-market benefits.

Investing in private sector mitigation activities

Private sector mitigation projects may occur on the basis of one of two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:

- Request cost sharing from public agencies;
- Dispose of the building or land either by sale or demolition;
- Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
- Evaluate the most feasible alternatives and initiate the most cost-effective hazard mitigation alternative.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchasers. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

CONDUCTING AN ECONOMIC ANALYSIS

Benefit/cost analysis and cost-effectiveness analysis are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating alternative mitigation activities is outlined below:

1. Identify the Alternatives. Alternatives for reducing risk from natural hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation project can assist in minimizing risk to natural hazards but do so at varying economic costs.

2. Calculate the Costs and Benefits. Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate alternative. Potential economic criteria to evaluate alternatives include:

    - *Determine the project cost*. This may include initial project development costs, and repair and operating costs of maintaining projects over time.
    - *Estimate the benefits*. Projecting the benefits, or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.
    - *Consider costs and benefits to society and the environment.* These are not easily measured but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.
    - *Determine the correct discount rate*. Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

3. Analyze and Rank the Alternatives. Once costs and benefits have been quantified, economic analysis tools can rank the alternatives. Two methods for determining the best alternative given varying costs and benefits include net present value and internal rate of return.

    - *Net present value*. Net present value is the value of the expected future returns of an investment minus the value of expected future cost expressed in today's dollars. If the net present value is greater than the project costs, the project may be determined feasible for implementation. Selecting the discount rate and identifying the present and future costs and benefits of the project calculates the net present value of projects.
    - *Internal Rate of Return*. Using the internal rate of return method to evaluate mitigation

projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project.

Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can

consider other factors, such as risk; project effectiveness; and economic, environmental, and social returns in choosing the appropriate project for implementation.

ECONOMIC RETURNS OF NATURAL HAZARD MITIGATION

The estimation of economic returns, which accrue to building or landowner as a result of natural hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

- Building damages avoided
- Content damages avoided
- Inventory damages avoided
- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor's income losses avoided

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

ADDITIONAL COSTS FROM NATURAL HAZARDS

Property owners should also assess changes in a broader set of factors that can change as a result of a large natural disaster. These are usually termed "indirect" effects, but they can have a very direct effect on the economic value of the owner's building or land. They can be positive or negative, and include changes in the following:

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure
- Infrastructure

- Regional exports and imports
- Local, state, and national regulations and policies
- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

ADDITIONAL CONSIDERATIONS

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for natural hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. Many communities are looking towards developing multi-objective projects. With this in mind, opportunity rises to develop strategies that integrate natural hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation.

RESOURCES

The following resources for economic analysis have been provided by the Disaster Management Area D Coordinator.

CUREe Kajima Project, Methodologies For Evaluating The Socio-Economic Consequences Of

Large Earthquakes, Task 7.2 Economic Impact Analysis, Prepared by University of California,

Berkeley Team, Robert A. Olson, VSP Associates, Team Leader; John M. Eidinger, G&E Engineering Systems; Kenneth A. Goettel, Goettel and Associates lnc.; and Gerald L. Horner, Hazard Mitigation Economics Inc., 1997.

Federal Emergency Management Agency, Benefit/Cost Analysis of Hazard Mitigation Projects, Riverine Flood, Version 1.05, Hazard Mitigation Economics Inc., 1996.

Federal Emergency Management Agency Report on Costs and Benefits of Natural Hazard Mitigation. Publication 331, 1996.

Goettel & Horner Inc., Earthquake Risk Analysis Volume Ill: The Economic Feasibility of Seismic Rehabilitation of Buildings in The City of Portland, Submitted to the Bureau of Buildings, City of Portland, August 30, 1995.

Goettel & Horner Inc., Benefit/Cost Analysis of Hazard Mitigation Projects Volume V, Earthquakes, Prepared for FEMA's Hazard Mitigation Branch, October 25, 1995.

Horner, Gerald, Benefit/Cost Methodologies for Use in Evaluating the Cost Effectiveness of Proposed Hazard Mitigation Measures, Robert Olson Associates, Prepared for Oregon State Police, Office of Emergency Management, July 1999.

Interagency Hazards Mitigation Team, _State Hazard Mitigation Plan, (Oregon State Police -Office of Emergency Management, 2000).

Risk Management Solutions, Inc., Development of a Standardized Earthquake Loss Estimation Methodology, National Institute of Building Sciences, Volume I and II, 1994.

VSP Associates, Inc., A Benefit/Cost Model for the Seismic Rehabilitation of Buildings, Volumes I & 2, Federal Emergency Management Agency, FEMA Publication Numbers 227 and 228, 1991.

YSP Associates, Inc., Benefit/Cost Analysis of Hazard Mitigation Projects: Section 404 Hazard Mitigation Program and Section 406 Public Assistance Program, Volume 3: Seismic Hazard Mitigation Projects, 1993.

YSP Associates, Inc., Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model, Volume I, Federal Emergency Management Agency, FEMA, Publication Number 255, 1994.

Appendix E:

List of Acronyms

APPENDIX E: LIST OF ACRONYMS

FEDERAL ACRONYMS	
AASHTO	American Association of State Highway and Transportation Officials
ATC	Applied Technology Council
BCA	Benefit/Cost Analysis
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BSSC	Building Seismic Safety Council
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CRS	Community Rating System
EDA	Economic Development
Mitigation EDA	Environmental Protection Agency
ER	Emergency Relief
EWP	Emergency Watershed Protection (NRCS Program)
FAS	Federal Aid System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
FTE	(FEMA Program)
GIS	Geographic Information System
GNS	Institute of Geological and Nuclear Sciences (International)
GSA	General Services Administration
HAZUS	Hazards U.S.
HMGP	Hazard Mitigation Grant Program
HMST	Hazard Mitigation Survey Team
HUD	Housing and Urban Development (United States, Department of)
IBHS	Institute for Business and Home Safety
ICC	Increased Cost of Compliance
IHMT	Interagency Hazard Mitigation Team
NCDC	National Climate Data Center
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHMP	Natural Hazard Mitigation Plan (also known as "409 Plan")
NIBS	National Institute of Building Sciences
NIFC	National Interagency Fire Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
SBA	Small Business Administration
SEAO	Structural Engineers Association of Oregon
SHMO	State Hazard Mitigation Officer

TOR	Transfer of Development Rights
UGB	Urban Growth Boundary
URM	Unreinforced Masonry
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFA	United States Fire Administration
USFS	United States Forest Service
USGS	United States Geological Survey
WSSPC	Western States Seismic Policy

CALIFORNIA ACRONYMS

A&W	Alert and Warning
AA	Administering Areas
AAR	After Action Report
ARC	American Red Cross
ARP	Accidental Risk Prevention
ATC20	Applied Technology Council 20
ATC21	Applied Technology Council 21
BCP	Budget Change Proposal
BSA	California Bureau of State Audits
CAER	Community Awareness & Emergency Response
CalARP	California Accidental Release Prevention
CalBO	California Building Officials
CalEPA	California Environmental Protection Agency
CalREP	California Radiological Emergency Plan
CALSTARS	California State Accounting Reporting System
CalTrans	California Department of Transportation
CBO	Community Based Organization
CD	Civil Defense
CDF	California Department of Forestry and Fire Protection
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEPEC	California Earthquake Prediction Evaluation Council
CESRS	California Emergency Services Radio System
CHIP	California Hazardous Identification Program
CHMIRS	California Hazardous Materials Incident Reporting System
CHP	California Highway Patrol
CLETS	California Law Enforcement Telecommunications System
CSTI	California Specialized Training Institute
CUEA	California Utilities Emergency Association
CUPA	Certified Unified Program Agency
DAD	Disaster Assistance Division (of the state Office of Emergency Svcs)
DFO	Disaster Field Office

DGS	California Department of General Services
DHSRHB	California Department of Health Services, Radiological Health Branch
DO	Duty Officer
DOC	Department Operations Center
DOE	Department of Energy (U.S.)
DOF	California Department of Finance
DOJ	California Department of Justice
DPA	California Department of Personnel Administration
DPIG	Disaster Preparedness Improvement Grant
DR	Disaster Response
DSA	Division of the State Architect
DSR	Damage Survey Report
DSW	Disaster Service Worker
DWR	California Department of Water Resources
EAS	Emergency Alerting System
EDIS	Emergency Digital Information System
EERI	Earthquake Engineering Research Institute
EMA	Emergency Management Assistance
EMI	Emergency Management Institute
EMMA	Emergency Managers Mutual Aid
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency (U.S.)
EPEDAT	Early Post Earthquake Damage Assessment Tool
EPI	Emergency Public Information
EPIC	Emergency Public Information Council
ESC	Emergency Services Coordinator
FAY	Federal Award Year
FDAA	Federal Disaster Assistance Administration
FEAT	Governor's Flood Emergency Action Team
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FIR	Final Inspection Reports
FIRESCOPE	Firefighting Resources of So. Calif Organized for Potential Emergencies
FMA	Flood Management Assistance
FSR	Feasibility Study Report
FY	Fiscal Year
GIS	Geographical Information System
HAZMAT	Hazardous Materials
HAZMIT	Hazardous Mitigation
HAZUS	Hazards United States (an earthquake damage assessment prediction tool)
HAD	Housing and Community Development
HEICS	Hospital Emergency Incident Command System
HEPG	Hospital Emergency Planning Guidance

HIA	Hazard Identification and Analysis Unit
HMEP	Hazardous Materials Emergency Preparedness
HMGP	Hazard Mitigation Grant Program
IDE	Initial Damage Estimate
IA	Individual Assistance
IFG	Individual & Family Grant (program)
IRG	Incident Response Geographic Information System
IPA	Information and Public Affairs (of state Office of Emergency Services)
LAN	Local Area Network
LEMMA	Law Enforcement Master Mutual Aid
LEPC	Local Emergency Planning Committee
MARAC	Mutual Aid Regional Advisory Council
MHID	Multi-hazard Identification
MOU	Memorandum of Understanding
NBC	Nuclear, Biological, Chemical
NEMA	National Emergency Management Agency
NEMIS	National Emergency Management Information System
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Association
NPP	Nuclear Power Plant
NSF	National Science Foundation
NWS	National Weather Service
OA	Operational Area
OASIS	Operational Area Satellite Information System
OCC	Operations Coordination Center
OCD	Office of Civil Defense
OEP	Office of Emergency Planning
OES	California Governor's Office of Emergency Services
OSHPD	Office of Statewide Health Planning and Development
OSPR	Oil Spill Prevention and Response
PA	Public Assistance
PC	Personal Computer
PDA	Preliminary Damage Assessment
PIO	Public Information Office
POST	Police Officer Standards and Training
PPA/CA	Performance Partnership Agreement/Cooperative Agreement/Cooperative Agreement (FEMA)
PSA	Public Service Announcement
PTAB	Planning and Technological Assistance Branch
PTR	Project Time Report
RA	Regional Administrator (OES)
RADEF	Radiological Defense (program)
RAMP	Regional Assessment of Mitigation Priorities
RAPID	Railroad Accident Prevention & Immediate Deployment
RDO	Radiological Defense Officer

RDMHC	Regional Disaster Medical Health Coordinator
REOC	Regional Emergency Operations Center
REPI	Reserve Emergency Public Information
RES	Regional Emergency Staff
RIMS	Response Information Management System
RMP	Risk Management Plan
RPU	Radiological Preparedness Unit (OES)
RRT	Regional Response Team
SAM	State Administrative Manual
SARA	Superfund Amendments & Reauthorization Act
SAVP	Safety Assessment Volunteer Program
SBA	Small Business Administration
SCO	California State Controller's Office
SEMS	Standardized Emergency Management System
SEPIC	State Emergency Public Information Committee
SLA	State and Local Assistance
SONGS	San Onofre Nuclear Generating Station
SOP	Standard Operating Procedure
SWEPC	Statewide Emergency Planning Committee
TEC	Travel Expense Claim
TRU	Transuranic
TTT	Train the Trainer
UPA	Unified Program Account
UPS	Uninterrupted Power Source
USAR	Urban Search and Rescue
USGS	United States Geological Survey California State
WC	Warning Center
WAN	Wide Area Network
WIPP	Waste Isolation Pilot Project

Source: Disaster Management Area D Coordinator, 2004.

Appendix F:

Glossary

APPENDIX F: GLOSSARY

Acceleration	The rate of change of velocity with respect to time. Acceleration due to gravity at the earth's surface is 9.8 meters per second squared. That means that every second that something falls toward the surface of earth its velocity increases by 9.8 meters per second.
Asset	Any manmade or natural feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wet-lands, or landmarks.
Base Flood	Flood that has a I percent probability of being equaled or exceeded in any given year. Also known as the 100-year flood.
Base Flood Elevation (BFE)	Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The Base Flood Elevation is used as the standard for the National Flood In-surance Program.
Bedrock	The solid rock that underlies loose material, such as soil, sand, clay, or gravel.
Building	A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheels and axles carry no weight.
Coastal High Hazard Area	Area, usually along an open coast, bay, or inlet, that is subject to inundation by storm surge and, in some instances, wave action caused by storms or seismic sources.
Coastal Zones	The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas having direct drainage to the ocean.
Community Rating System (CRS)	An NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of policyholders in these communities are reduced.
Computer-Aided Design and Drafting (CADD)	A computerized system enabling quick and accurate electronic 2-D and 3-D drawings, topographic mapping, site plans, and profile/cross-section drawings.
Contour	A line of equal ground elevation on a topographic (contour) map.
Critical Facility	Facilities that are critical to the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.
Debris	The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.
Digitalize	To convert electronically points, lines, and area boundaries shown on maps into x, y coordinates (e.g., latitude and longitude, universal transverse mercator (UTM), or table coordinates) for use in computer

	applications.
Displacement Time	The average time (in days) which the building's occupants typically must operate from a temporary location to while repairs are made to the original building due to damages resulting from a hazard event.
Duration	How long a hazard event lasts.
Earthquake	A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.
Erosion	Wearing away of the land surface by detachment and movement of soil and rock fragments, during a flood or storm or over a period of years, through the action of wind, water, or other geologic processes.
Erosion Hazard Area	Area anticipated to be lost to shoreline retreat over a given period of time. The projected inland extent of the area is measured by multiplying the average annual long-term recession rate by the number of years desired.
Essential Facility	Elements that are important to ensure a full recovery of a community or state following a hazard event. These would include: government functions, major employers, banks, schools, and certain commercial establishments, such as grocery stores, hardware stores, and gas stations.
Extent	The size of an area affected by a hazard or hazard event.
Extratropical Cyclone	Cyclonic storm events like Nor'easters and severe winter low-pressure systems. Both West and East coasts can experience these non-tropical storms that produce gale-force winds and precipitation in the form of heavy rain or snow. These cyclonic storms, commonly called nor'easters on the East Coast because of the direction of the storm winds, can last for several days and can be very large -1,000-mile wide storms are not uncommon.
Fault	A fracture in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust, in which adjacent surfaces are differentially displaced parallel to the plane of fracture.
Federal Emergency Management Agency (FEMA)	Independent agency created in 1978 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response and recovery.
Fire Potential Index (FPI)	Developed by USGS and USFS to assess and map fire hazard potential over broad areas. Based on such geo-graphic information, national policy makers and on-the-ground fire managers established priorities for prevention activities in the defined area to reduce the risk of managed and wildfire ignition and spread. Prediction of fire hazard shortens the time between fire ignition and initial attack by enabling fire managers to pre-allocate and stage sup-pression forces to high fire risk areas.
Flash Flood	A flood event occurring with little or no warning where water levels rise at an extremely fast rate.
Flood	A general and temporary condition of partial or complete inundation of nor-mally dry land areas from (I) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from

	any source, or (3) mudflows or the sudden collapse of shoreline land.
Flood Depth	Height of the floodwater surface above the ground surface.
Flood Elevation	Elevation of the water sur-face above an established datum, e.g. National Geodetic Vertical Datum of 1929, North American Ver-tical Datum of 1988, or Mean Sea Level.
Flood Hazard Area	The area shown to be inundated by a flood of a given magnitude on a map.
Flood Insurance Rate Map (FIRM)	Map of a community, pre-pared by the Federal Emergency Management Agency that shows both the special flood hazard areas and the risk premium zones applicable to the community.
Flood Insurance Study (FIS)	A study that provides an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations in a community or communities.
Floodplain	Any land area, including watercourse, susceptible to partial or complete inundation by water from any source.
Frequency	A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average, and would have a 1 percent chance -its probability-of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.
Fujita Scale of Tornado Intensity	Rates tornadoes with numeric values from F0 to F5 based on tornado wind-speed and damage sustained. An F0 indicates minimal damage such as broken tree limbs or signs, while and F5 indicated severe damage sustained.
Functional Downtime	The average time (in days) during which a function (business or service) is unable to provide its services due to a hazard event.
Geographic Area Impacted	The physical area in which the effects of the hazard are experienced.
Geographic Information Systems (GIS)	A computer software application that relates physical features on the earth to a database to be used for mapping and analysis.
Ground Motion	The vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter, but soft soils can further amplify ground motions.
Hazard	A source of potential danger or adverse condition. Hazards in this how-to series will include naturally occurring events such as floods, earthquakes, tornadoes, tsunami, coastal storms, landslides, and wildfires that strike populated areas. A natural event is a hazard when it has the potential to harm people or property.
Hazard Event	A specific occurrence of a particular type of hazard.
Hazard Identification	The process of identifying hazards that threaten an area.
Hazard Mitigation	Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.

Hazard Profile	A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.
HAZUS (Hazards US)	A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA
Hurricane	An intense tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74- miles-per-hour or more and blow in a large spiral around a relatively calm center or "eye." Hurricanes develop over the north Atlantic Ocean, northeast Pacific Ocean, or the south Pacific Ocean east of 160°E longitude. Hurricane circulation is counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere.
Hydrology	The science of dealing with the waters of the earth. A flood discharge is developed by a hydrologic study.
Infrastructure	Refers to the public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treat-ment facilities, and includes an area's transportation sys-tem such as airports, heliports; highways, bridges, tunnels, roadbeds, over-passes, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, drydocks, piers and regional dams.
Intensity	A measure of the effects of a hazard event at a particular place.
Landslide	Downward movement of a slope and materials under the force of gravity.
Lateral Spreads	Develop on gentle slopes and entail the sidelong movement of large masses of soil as an underlying layer liquefies in a seismic event. The phenomenon that occurs when ground shaking causes loose soils to lose strength and act like viscous fluid. Liquefaction causes two types of ground failure: lateral spread and loss of bearing strength.
Liquefaction	Results when the soil supporting structures liquefies. This can cause structures to tip and topple.
Lowest Floor	Under the NFIP, the lowest floor of the lowest enclosed area (including basement) of a structure.
Magnitude	A measure of the strength of a hazard event. The magnitude (also referred to as severity) of a given hazard event is usually determined using technical measures specific to the hazard.
Mitigation Plan	A systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in the state and includes a description of actions to minimize future vulnerability to hazards.
National Flood Insurance Program (NFIP)	Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 CFR §60.3.
National Geodetic Vertical	Datum established in 1929 and used in the NFIP as a basis for

Datum of 1929 (NGVD)	measuring flood, ground, and structural ele-vations, previously referred to as Sea Level Datum or Mean Sea Level. The Base Flood Elevations shown on most of the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency are referenced to NGVD.
National Weather Service (NWS)	Prepares and issues flood, severe weather, and coastal storm warnings and can provide technical assistance to Federal and state entities in preparing weather and flood warning plans.
Nor'easter	An extra-tropical cyclone producing gale-force winds and precipitation in the form of heavy snow or rain.
Outflow	Follows water inundation creating strong currents that rip at structures and pound them with debris and erode beaches and coastal structures.
Planimetric	Describes maps that indicate only man-made features like buildings.
Planning	The act or process of making or carrying out plans; the establishment of goals, policies and procedures for a social or economic unit.
Probability	A statistical measure of the likelihood that a hazard event will occur.
Recurrence Interval	The time between hazard events of similar size in a given location. It is based on the probability that the given event will be equaled or exceeded in any given year.
Repetitive Loss Property	A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least $1,000 each have been paid within any 10-year period since 1978.
Replacement Value	The cost of rebuilding a structure. This is usually expressed in terms of cost per square foot and reflects the present-day cost of labor and materials to construct a building of a particular size, type and quality.
Richter Scale	A numerical scale of earthquake magnitude devised by seismologist C.F. Richter in 1935.
Risk	The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.
Riverine	Of or produced by a river.
Scale	A proportion used in determining a dimensional relationship; the ratio of the distance between two points on a map and the actual distance between the two points on the earth's surface.
Scarp	A steep slope.
Scour	Removal of soil or fill material by the flow of floodwaters. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.
Seismicity	Describes the likelihood of an area being subject to earthquakes.
Special Flood Hazard Area (SFHA)	An area within a floodplain having a 1 percent or greater chance of flood occurrence in any given year (100-year floodplain); represented

	on Flood Insurance Rate Maps by darkly shaded areas with zone designations that include the letter A or V.
Stafford Act	The Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-107 was signed into law November 23, 1988 and amended the Disaster Relief Act of 1974, PL 93-288. The Stafford Act is the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and its programs.
State Hazard Mitigation Officer (SHMO)	The representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.
Storm Surge	Rise in the water surface above normal water level on the open coast due to the action of wind stress and atmospheric pressure on the water surface.
Structure	Something constructed. (See also Building)
Substantial Damage	Damage of any origin sustained by a structure in a Special Flood Hazard Area whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage.
Super Typhoon	A typhoon with maximum sustained winds of 150 mph or more.
Surface Faulting	The differential movement of two sides of a fracture - in other words, the location where the ground breaks apart. The length, width, and displacement of the ground characterize surface faults.
Tectonic Plate	Torsionally rigid, thin seg-ments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity.
Topographic	Characterizes maps that show natural features and indicate the physical shape of the land using contour lines. These maps may also include manmade features.
Tornado	A violently rotating column of air extending from a thunderstorm to the ground.
Tropical Cyclone	A generic term for a cyclonic, low-pressure system over tropical or subtropical waters.
Tropical Depression	A tropical cyclone with maximum sustained winds of less than 39 mph.
Tropical Storm	A tropical cyclone with maximum sustained winds greater than 39 mph and less than 74 mph.
Tsunami	Great sea wave produced by submarine earth movement or volcanic eruption.
Typhoon	A special category of tropical cyclone peculiar to the western North Pacific Basin, frequently affecting areas in the vicinity of Guam and the North Mariana Islands. Typhoons whose maximum sustained winds attain or exceed 150 mph are called super typhoons.
Vulnerability	Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of

	another. For example, many businesses depend on uninterrupted electrical power -if an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect effects can be much more widespread and damaging than direct ones.
Vulnerability Assessment	The extent of injury and damage that may result from a hazard event of a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.
Water Displacement	When a large mass of earth on the ocean bottom sinks or uplifts, the column of water directly above it is displaced, forming the tsunami wave. The rate of displacement, motion of the ocean floor at the epicenter, the amount of displacement of the rupture zone, and the depth of water above the rupture zone all contribute to the intensity of the tsunami.
Wave Runup	The height that the wave extends up to on steep shorelines, measured above a reference level (the normal height of the sea, corrected to the state of the tide at the time of wave arrival).
Wildfire	An uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.
Zone	A geographical area shown on a Flood Insurance Rate Map (FIRM) that reflects the severity or type of flooding in the area

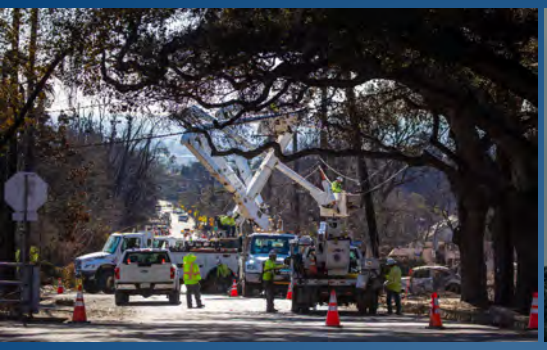
Source: Disaster Management Area D Coordinator, 2004.

APPENDIX C

COUNTY OF LOS ANGELES ALL-HAZARDS MITIGATION PLAN

2025 County of Los Angeles All-Hazards Mitigation Plan

Chief Executive Office - Office of Emergency Management









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County Departments

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Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

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Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

9/9/25
Date

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1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team
	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

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Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview



Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use



Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

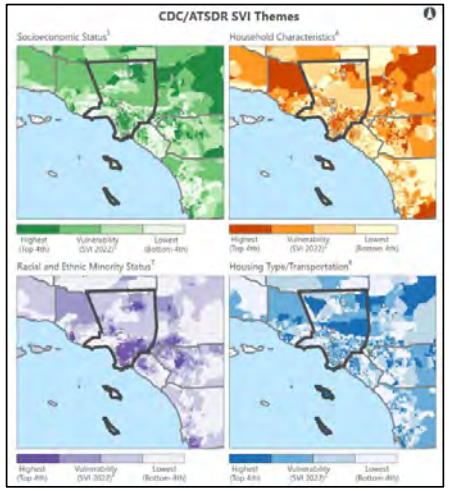


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

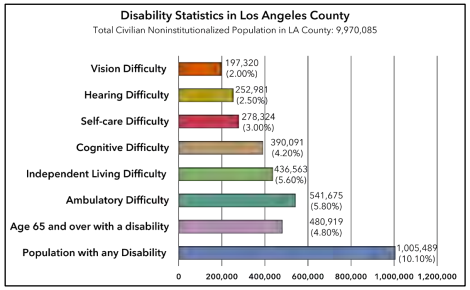


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

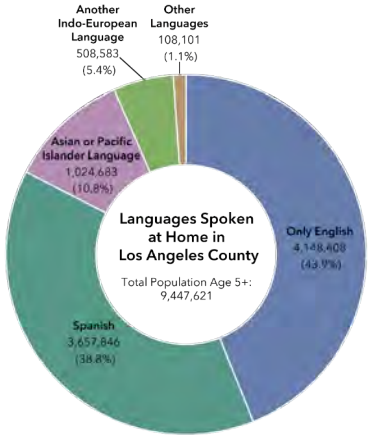


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

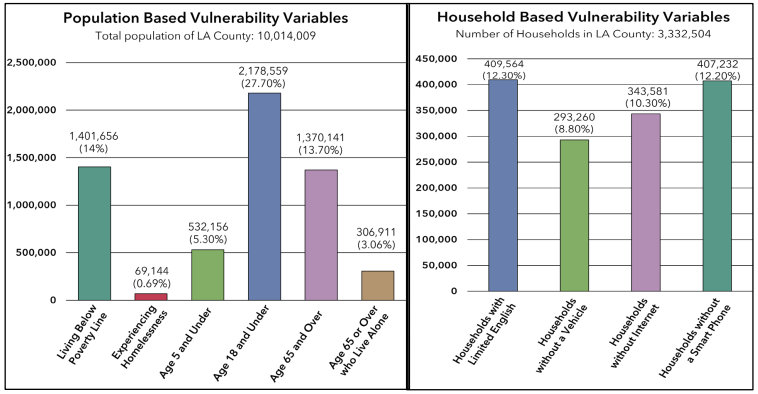


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

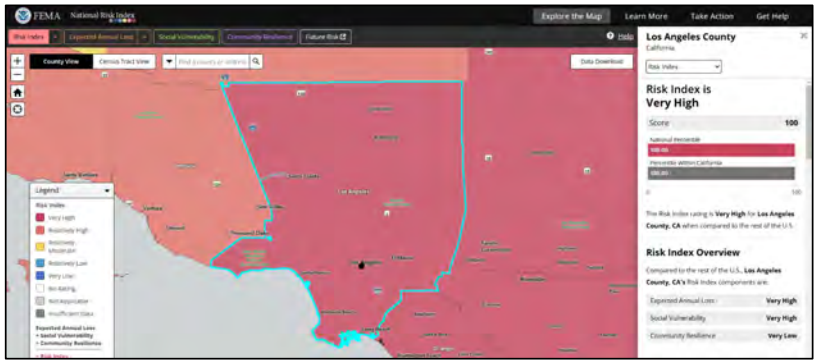


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.

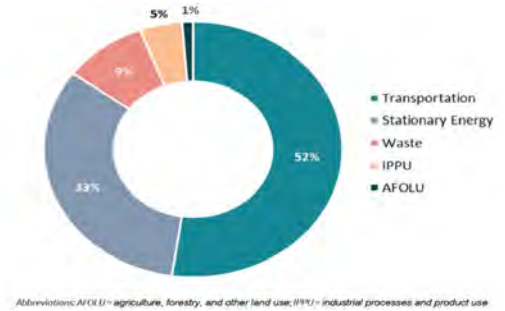


Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
  - Surveys of community needs
  - Consultations with AFN advisory groups
  - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.



- **C-MIST Explanation**
  - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
  - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
  - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
  - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
  - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.



6.2 Wildfire

6.2.1 Nature



Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows—especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD3**: 117.95 sq mi (27.29%)
    - **SD5**: 95.61 sq mi (3.36%)
    - **SD1**: 16.23 sq mi (4.60%)
    - **SD4**: 9.10 sq mi (4.27%)
    - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.



6.3 Earthquake

6.3.1 Nature



Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant. Buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 1,950.78 sq mi (69.50%)
    - **SD3**: 379.41 sq mi (87.99%)
    - **SD1**: 349.17 sq mi (98.95%)
    - **SD2**: 362.95 sq mi (99.99%)
    - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.



6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.



6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	**Figure 6.4.1 Risk of Heat-Related Impacts**
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

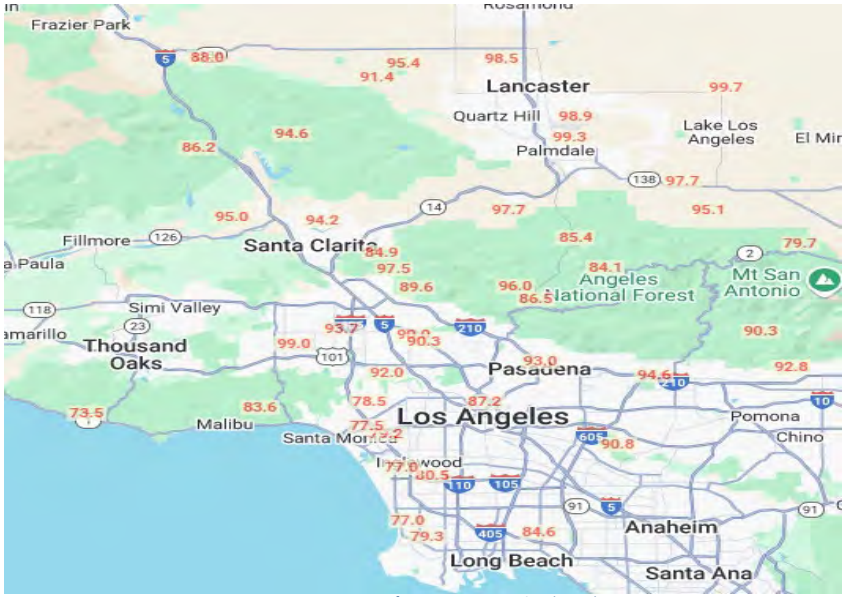


Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.



Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.



6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.



There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

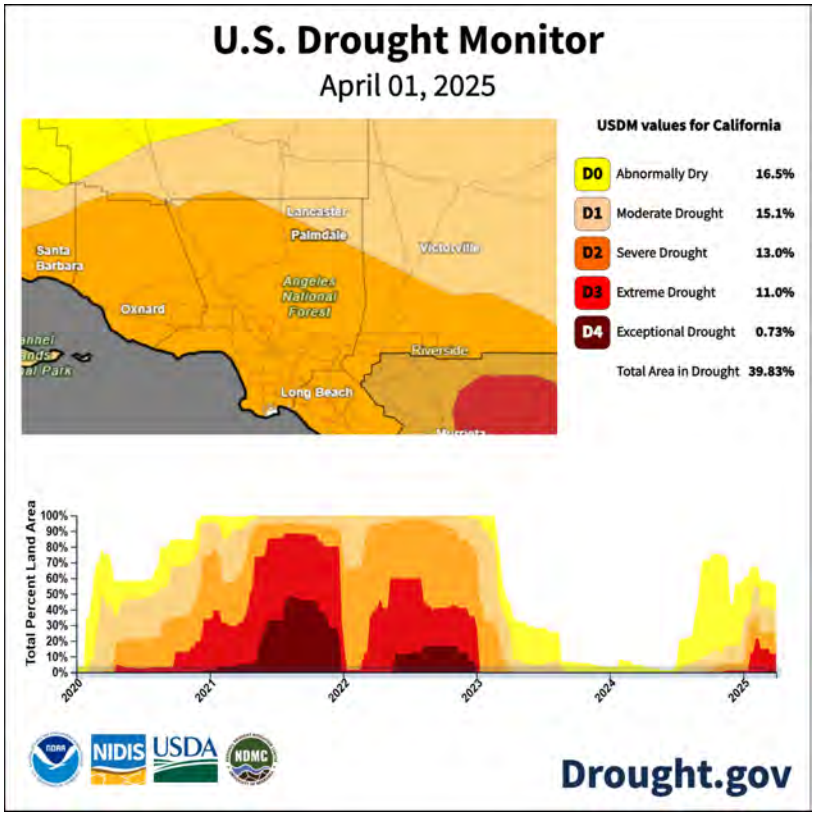


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

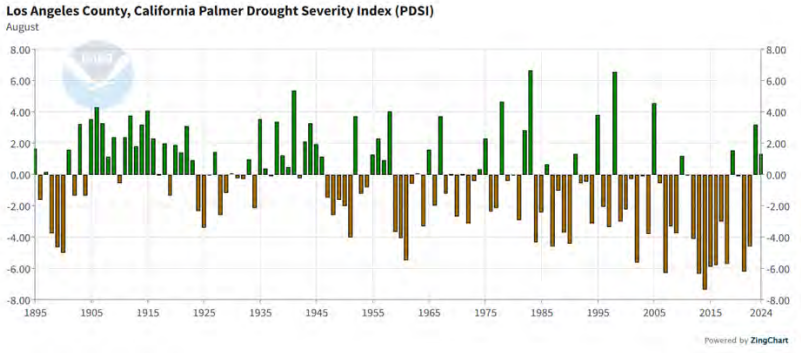


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.



6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.



Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.



6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 223.88 sq mi (7.97%)
    - **SD1**: 162.25 sq mi (45.98%)
    - **SD2**: 66.57 sq mi (18.32%)
    - **SD3**: 25.76 sq mi (5.97%)
    - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
    - Fire Department: 112 (33.22%)
    - Public Works: 92 (40.00%)
    - Health Services: 29 (44.62%)
    - Public Health: 17 (42.50%)
    - Libraries: 30 (34.48%)
    - Parks: 65 (35.50%)
    - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness–making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.



6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.



Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

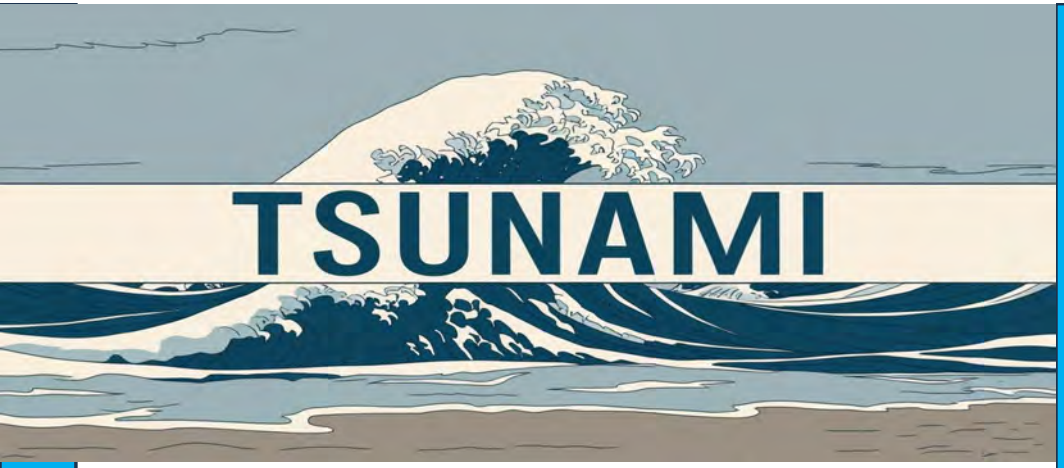
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

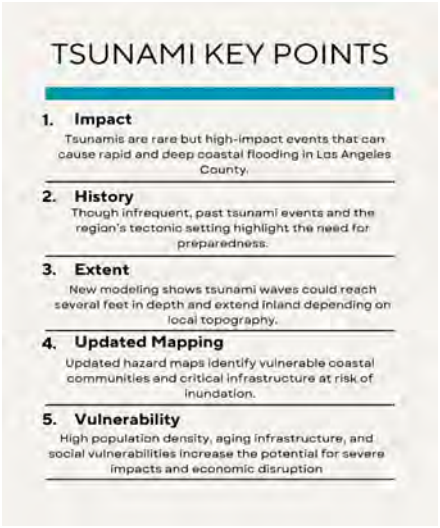
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map—developed using enhanced modeling techniques and updated coastal geomorphology data—highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.



6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.



Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023** (**DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

6.10.9 Summary

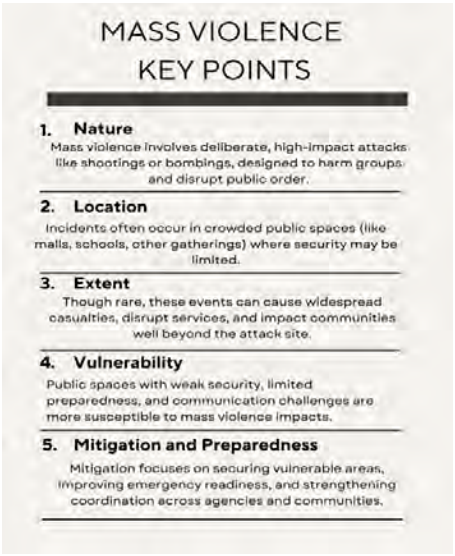
Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.



6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.



- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.



6.12 Cybersecurity Incidents

6.12.1 Nature



Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:

- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents—both in terms of economic impact and service disruption—highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.



6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

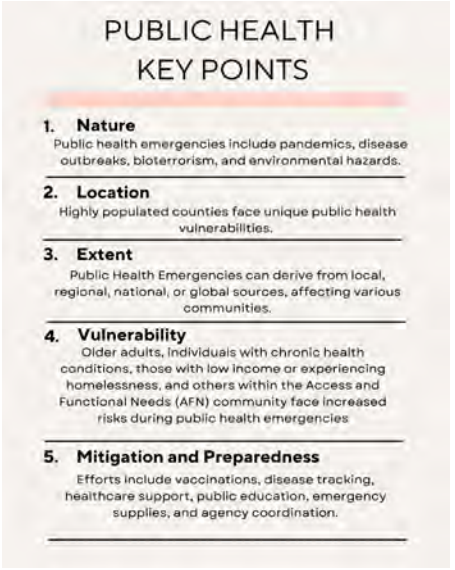
- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.



6.14 Public Health Emergencies

6.14.1 Nature



Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

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7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* **Land Movement** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.	*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**
Source: Los Angeles County Department of Public Works	
Type: Structural and Infrastructure Projects	
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.	*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**
Source: Los Angeles County Department of Public Works, among others.	
Type: Natural Systems Protections	
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.	*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.	*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works	
Type: Education and Awareness Programs	
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.	*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.	*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		*S****evere Wind/Tornado***				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	**Earthquake** **Dam Failure**	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	**Drought**	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	**Drought**	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	**Extreme Heat**	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	**Flooding** **Tsunami**	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	**Mass Violence** **Cyber Incidents**	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	**Mass Violence** **Cyber Incidents**	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	**Mass Violence**	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	**Extreme Heat**	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	**Public Health Emergencies**	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	**Wildfire** **Mass Violence**	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the

incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices

APPENDIX D

CITY OF POMONA WATER RATE STRUCTURE

RESOLUTION NO. 2019-127

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA APPROVING NEW RATE STRUCTURES FOR WATER AND RECYCLED WATER FEES AND SERVICE CHARGES AND INCREASING SEWER SERVICE FEES

WHEREAS, Chapter 62 of the Pomona City Code, Article IV, Municipal Water Utility, Section 62-195 and 62-291, establishes the City's ability to charge bimonthly fees for the supply of water and recycled water to customers within and outside the City of Pomona, and established the City Council's authority to set water and recycled water rates by resolution;

WHEREAS, Chapter 62 of the Pomona City Code, Article V, Sewer Disposal, Section 62-400, establishes the City's ability to charge bimonthly fees for sewer services to customers, and establishes the City Council's authority to set sewer service rates by resolution;

WHEREAS, this resolution adjusting water, recycled water, and sewer service rates shall apply only to Chapter 62 of the Pomona City Code, Article IV and V, Municipal Water Utility and Sewer Disposal, respectively;

WHEREAS, the City previously retained Raftelis Financial Consultants, an independent financial consultant to review the City's water, recycled water, and sewer utilities to determine whether rates for service charges are sufficient to meet increased costs of service, and to prepare a cost of service analysis and rate study (the "Study");

WHEREAS, based on the results of the Study (a copy of which is available for inspection at the office of the City Clerk, and was also posted on the City's website), increases to the rates for water, recycled water, and sewer service fees and charges are necessary;

WHEREAS, the proposed potable water rate structure includes a fixed service charge imposed on a bimonthly basis, and a commodity charge. The fixed service charge includes a meter service charge, determined based on the size of the meter serving the property (measured in inches), and recovers the cost to maintain and replace meters as well as a portion of extra-capacity related costs, and a customer service component, which is the same for all meters regardless of size. The proposed commodity charge is based on the amount of water consumed, measured in dollars per hundred cubic feet ("CCF") delivered to the property, and is divided into domestic and irrigation customer classes based on shared patterns of usage;

WHEREAS, the proposed potable water rate structure also includes fire service charges for certain properties in the City that have private fire service meters installed, and which is charged based on the size of the fire meter serving the property;

WHEREAS, the proposed recycled water rate structure includes a commodity charge, which is determined based on the number of acre feet of recycled water delivered to a property, and a bimonthly recycled water service charge, based on the size of the recycled water meter serving the property;

WHEREAS, the proposed sewer service charges include a bimonthly service charge, which is uniform for all customers, and a consumption charge, which is applied per unit of water consumption defined as the average of two complete months data within the period of December of the previous year through the following March;

WHEREAS, the proposed rate structures are for a period of five years, and are proposed to take effect October 1, 2019, and to increase each January 1 thereafter commencing January 1, 2020, through and including January 1, 2023;

WHEREAS, the proposed potable water, recycled water, and sewer service fees (collectively, the "Fees") are property-related fees within the meaning of article XIII D of the California Constitution;

WHEREAS, the revenues derived from the Fees will not exceed the funds required to provide the services for which the Fees are imposed, and will be used exclusively for the operation and maintenance of the City's potable water, recycled water, and sewer systems;

WHEREAS, the Fees are equitable to all customer classes;

WHEREAS, the amount of the Fees will not exceed the proportional cost of the service attributable to each parcel upon which they are proposed for imposition;

WHEREAS, the Fees will not be imposed on a parcel unless the service for which such Fees are imposed, is actually used by, or immediately available to, the owner of the parcel;

WHEREAS, article XIII D, section 6 of the California Constitution ("Article XIII D") requires that prior to imposing any increase to the Fees, the City shall provide written notice (the "Notice") by mail of the new or increased Fees to the record owner of each parcel upon which the Fees are proposed for imposition and any tenant directly liable for payment of the Fees, the amount of the Fees proposed to be imposed on each parcel, the basis upon which the Fees were calculated, the reason for the Fees, and the date time and location of a public hearing (the "Hearing") on the proposed Fees;

WHEREAS, on July 19, 2019, the City distributed notices as required by Article XIII D regarding the City Council's consideration of the proposed rate adjustments to the Fees at the September 16, 2019, public hearing to all property owners of record and utility customers in accordance with Article XIII D, Section 6(a)(1) of the California Constitution, and Government Code Section 53755;

WHEREAS, on September 16, 2019, the City Council held a duly noticed public hearing on the proposed Fees contained in this Resolution, and at that time invited oral and written comments from the public;

WHEREAS, upon close of said public hearing, the City did receive __0__ written protests to the proposed Fees; and

WHEREAS, the City Council now desires to establish rates for the Fees, effective October 1, 2019, at the rates and subject to increases on the dates set forth in the schedules included as Exhibit A hereto.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. That the adoption of this Resolution falls within a statutory exemption from environmental review pursuant to sections 15273, 15060(c)(2) of the State Guidelines for Implementation of the California Environmental Quality Act (CEQA), which pertain to the establishment, modification, structuring, restructuring, or approval of rates and charges by public agencies which the public agency finds are for the purpose of meeting operating expenses, and pertain to activities that will not result in a direct or reasonably foreseeable indirect change to the environment and that are not defined as a project under CEQA Regulations.

SECTION 2. That after considering the material presented in the Study, the City Council hereby finds as follows:

(a) Revenues derived from the Fees do not exceed the funds required to provide the property related service;
(b) Revenues derived from the Fees are not used for any purpose other than for which the Fees or charges is imposed;
(c) The amount of the Fees imposed upon any parcel or person does not exceed the proportional cost of service attributable to the parcel;
(d) The Fees are imposed for services that are actually used by, or immediately available to, the owner of the property upon which the Fees are imposed.

SECTION 3. That after receiving public comment and testimony on the new fee structure for water, sewer and recycled water services provided, and absent a majority protest to the proposed fee increases, the new fee schedule for water, sewer and recycled water fees and charges are hereby approved as set forth in Exhibit "A" attached hereto and incorporated herein by this reference.

SECTION 4. That the new fee schedule for water, sewer and recycled water services shall be implemented beginning October 1, 2019, and shall be increased annually on the dates set forth in Exhibit "A" hereto, up to the maximum rates set forth in Exhibit "A" hereto. To the extent any other resolution of the City conflicts with the provisions set forth herein, it is the explicit intent of the City Council that the provisions of this Resolution shall supersede.

SECTION 5. That all water charges subject to the adjusted fee schedule may resume annual CPI adjustment, as outlined in City Code Section 62-271, starting on January 1, 2024.

SECTION 6. The City Clerk shall attest and certify to the passage and adoption of this Resolution.

PASSED, APPROVED AND ADOPTED this 16th day of September, 2019.

CITY OF POMONA:

Tim Sandoval
Mayor

APPROVED AS TO FORM:

Sonia Carvalho Reso 2019-127
Sonia Carvalho
City Attorney

ATTEST:

Rosalia A. Butler, MMC
City Clerk

I, HEREBY CERTIFY that the foregoing resolution was duly adopted by the City Council of the City of Pomona at a regular meeting thereof held on September 16, 2019 by the following vote of the Council:

AYES:	Garcia, Gonzalez, Lustro, Ontiveros-Cole, Preciado, Torres, Sandoval
NOES:	None
ABSTAIN:	None
ABSENT:	None

Rosalia A. Butler, MMC
City Clerk

Rate Schedule

Bimonthly Potable Water Service Charge

Meter	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
5/8"	$ 41.29	$ 45.52	$ 50.19	$ 55.33	$ 59.21
3/4"	$ 60.92	$ 67.17	$ 74.05	$ 81.64	$ 87.35
1"	$ 100.18	$ 110.45	$ 121.77	$ 134.25	$ 143.65
1-1/2"	$ 198.33	$ 218.65	$ 241.07	$ 265.77	$ 284.38
2"	$ 316.10	$ 348.50	$ 384.22	$ 423.60	$ 453.26
3"	$ 590.91	$ 651.48	$ 718.25	$ 791.87	$ 847.31
4"	$ 983.49	$ 1,084.30	$ 1,195.44	$ 1,317.97	$ 1,410.23
6"	$ 1,964.95	$ 2,166.36	$ 2,388.41	$ 2,633.22	$ 2,817.55
8"	$ 3,142.70	$ 3,464.83	$ 3,819.97	$ 4,211.52	$ 4,506.33
10"	$ 4,516.75	$ 4,979.71	$ 5,490.13	$ 6,052.87	$ 6,476.57

Potable Water Commodity Rate Structure

Water Use	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
Domestic	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF
1-13 Units	$1.77	$1.95	$2.15	$2.37	$2.54
14-35 Units	$2.24	$2.47	$2.72	$3.00	$3.21
36 Units and Over	$2.36	$2.60	$2.87	$3.16	$3.38
Irrigation					
1-13 Units	$1.88	$2.07	$2.28	$2.51	$2.69
13-35 Units	$2.60	$2.87	$3.16	$3.48	$3.72
36 Units and Over	$2.65	$2.92	$3.22	$3.55	$3.80

Bimonthly Recycled Water Service Charge

Meter	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
2"	$ 63.22	$ 69.70	$ 76.84	$ 84.72	$ 90.65
3"	$ 118.18	$ 130.30	$ 143.65	$ 158.37	$ 169.46
4"	$ 196.70	$ 216.86	$ 239.09	$ 263.59	$ 282.05
6"	$ 392.99	$ 433.27	$ 477.68	$ 526.64	$ 563.51
8"	$ 628.54	$ 692.97	$ 763.99	$ 842.30	$ 901.27
10"	$ 903.35	$ 995.94	$ 1,098.03	$ 1,210.57	$ 1,295.31
12"	$ 1,963.33	$ 2,164.57	$ 2,386.43	$ 2,631.04	$ 2,815.22
14"	$ 2,944.78	$ 3,246.62	$ 3,579.40	$ 3,946.29	$ 4,222.53
16"	$ 3,926.24	$ 4,328.68	$ 4,772.37	$ 5,261.54	$ 5,629.85
18"	$ 4,907.70	$ 5,410.74	$ 5,965.34	$ 6,576.79	$ 7,037.17

Recycled Water Commodity Rate Structure (Cost Per Acre Foot)

October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
$ 566.47	$ 589.42	$ 546.92	$ 566.55	$ 587.74

Sewer Rates

	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
Bimonthly Service Charge	$ 9.39	$ 9.96	$ 10.56	$ 11.19	$ 11.75
Rate Per Unit of Consumption	$ 0.70	$ 0.74	$ 0.78	$ 0.83	$ 0.87

Fire Service Rates

Size	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
2" or less	$ 8.64	$ 9.53	$ 10.50	$ 11.58	$ 12.39
3"	$ 25.10	$ 27.67	$ 30.51	$ 33.63	$ 35.99
4"	$ 53.48	$ 58.96	$ 65.01	$ 71.67	$ 76.69
6"	$ 155.36	$ 171.28	$ 188.84	$ 208.19	$ 222.76
8"	$ 331.07	$ 365.00	$ 402.41	$ 443.66	$ 474.72
10"	$ 595.37	$ 656.40	$ 723.68	$ 797.86	$ 853.71
12"	$ 961.69	$ 1,060.27	$ 1,168.95	$ 1,288.76	$ 1,378.97

RESOLUTION NO. 2019-128

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF POMONA CHANGING WATER RATES FOR TEMPORARY CONTRACTOR METER WATER USAGE AND SETTING AVAILABILITY PRICING FOR WHOLESALE RECYCLED WATER CUSTOMERS SELLING WATER OUTSIDE THE AREA SERVED BY THE CITY

WHEREAS, Chapter 62 of the Pomona City Code, Article IV, Municipal Water Utility, Section 62-297 establishes the City's ability to charge fees for the temporary supply of water through construction water meters and the City Council's authority to set water services by resolution;

WHEREAS, this resolution adjusting rates for water for temporary service for contractors shall apply only to Chapter 62 of the Pomona City Code, Article IV, Municipal Water Utility;

WHEREAS, a notice of the September 16, 2019, public hearing on the proposed rate adjustments was published in the Inland Valley Daily Bulletin on September 6 and September 13, 2019;

WHEREAS, for each fee, the City completed a cost of service study and has determined the rates are appropriate;

WHEREAS, the supply of water for temporary service for contractors shall be subject to a surcharge, and added to the amount of water used in each tier, equal to that levied upon the City by the Metropolitan Water District and/or other suppliers of imported water as a part of their water conservation plan as constituted or as modified;

WHEREAS, the City is the purveyor of potable, nonpotable and recycled water within its service area and has a contract with the Sanitation District of Los Angeles County to receive 2/3 of the recycled water produced at the District's Pomona Wastewater Treatment Plant;

WHEREAS, the City can act as a wholesaler and supply recycled water to customers who later supply said water to users outside of the area served by the City;

WHEREAS, the City can supply water to customers who utilize recycled water in areas not serviced by the City and served by another water provider;

WHEREAS, the City's primary objective is to supply recycled water to recycled water customers within the area served by the City;

WHEREAS, in the summer there may be times when recycled water available to the City is insufficient to meet demands, in such instances the City must mix potable water into the recycled water system, which substantially increases the cost for providing recycled water;

WHEREAS, when the demand for recycled water reaches the threshold that requires potable water be used to increase available recycled water, threshold rates will apply to any customer who uses recycled water to sell for use outside of the area served by the City. All users in the area served by City will continue to be charged the applicable rate, depending on usage;

WHEREAS, this resolution delineates how recycled water will be allocated to City customers and what rate each customer will be billed for the water they receive;

WHEREAS, the rates established pursuant to this resolution are imposed for a specific government service or product provided directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of providing the service or product, and the cost of service analysis supporting the rates is on file with the City Clerk and available for inspection.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Pomona as follows:

SECTION 1. The adoption of this Resolution falls within a statutory exemption from environmental review pursuant to sections 15273, 15060(c)(2) of the State Guidelines for Implementation of the California Environmental Quality Act (CEQA), which pertain to the establishment, modification, structuring, restructuring, or approval of rates and charges by public agencies which the public agency finds are for the purpose of meeting operating expenses, and pertain to activities that will not result in a direct or reasonably foreseeable indirect change to the environment and that are not defined as a project under CEQA Regulations;

SECTION 2. That after review of cost of service analysis for providing water services, and the financial analysis of the water and sewer utility funds, the Council had determined that the new rates for the services provided below are reasonable and justified and are hereby approved as set forth below.

Bimonthly Temporary Construction Water Service Charge (Potable Water)

Meter	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
1"	$ 100.18	$ 110.45	$ 121.77	$ 134.25	$ 143.65
3"	$ 590.91	$ 651.48	$ 718.25	$ 791.87	$ 847.31

Temporary Construction Water Commodity Rate Structure (Potable Water)

Water Use		October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
Tiers		Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF
1	1-13 Units	$ 1.77	$ 1.95	$ 2.15	$ 2.37	$ 2.54
2	14-35 Units	$ 2.24	$ 2.47	$ 2.72	$ 3.00	$ 3.21
3	36 Units and Over	$ 2.36	$ 2.60	$ 2.87	$ 3.16	$ 3.38
	Imported Water Conservation Charge	$ -	$ -	$ -	$ -	$ -

Bimonthly Temporary Construction Water Service Charge (Recycled Water)

Meter	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
1"	$20.04	$22.09	$24.35	$26.85	$28.73
3"	$ 118.18	$ 130.30	$ 143.65	$ 158.37	$ 169.46

Temporary Construction Water Commodity Rate Structure (Recycled Water)

Water Use	October 1, 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023
	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF	Cost per CCF
CCF Units	$ 1.30	$ 1.35	$ 1.26	$ 1.30	$ 1.35

Contractors shall provide a refundable deposit for construction meters at the rates shown below. Additionally, the City shall collect an advance payment equal to the rate of a single bimonthly service charge at the requested meter size and type of water to be utilized and 55 CCF at the then current rate, said deposit and advance payment is to guarantee payment for all water used and return of the meter. Lost, stolen or damaged meters are the responsibility of the contractor and will be repaired or replaced at the determination of the City.

Deposit amount:

1 Inch Meter- $288.00
3 Inch Meter- $1,031.00

SECTION 3. The water rates and service charges amended by this five-year rate adjustment plan will resume annual CPI adjustment, effective January 1st of each year, as outlined in City Code Section 62-271, starting on January 1, 2024.

SECTION 4. The City shall bill recycled water customers who are reselling City water, or utilizing recycled water outside the area served by the City, based on the following criteria:

Phase I. When there is sufficient recycled water available to meet needs of recycled water customers within the area served by the City, the City will charge the City's rates then in effect for retail recycled water service based on the meter size and recycled water consumption.

Phase II. When recycled water is insufficient to meet the needs of the City's retail recycled water customers, and the City is required to supplement the recycled water system by adding potable water to the recycled water system to meet recycled water demands, the City's Tier 3 rates then in effect for potable water service charges will be charged for the potable water added to the recycled water system and sold outside of the area served by the City. To determine the billing for the amount of potable water used, the City will use the following criteria.

When potable water is added to the recycled water system to meet wholesale demands, the City will sum all wholesale meter consumptions and subtract the potable water added, giving the volume recycled water provided to the

system. The recycled water volume will then be divided by the number of wholesale customers, and subtracted from their wholesale meter read volume, thereby providing the portion of potable water added to the system to meet their demands. Once this is determined, the City will invoice each customer for their portion of recycled water and potable water at the appropriate current rate.

If the total wholesale billings is less than the potable water delivered to the recycled water system in a billing cycle, customers will be billed at the then current tier 3 potable water rate for all water used.

If a wholesale customer does not fully use their portion of recycled water per billing cycle, the unused recycled water will be evenly distributed to the other wholesale recycled water customers.

Phase III. If the Water Resources Department determines that there is insufficient recycled water for wholesale use, based on the City's inability to obtain enough recycled water to keep up with system demands, the Department shall notify impacted customers as soon as possible and discontinue providing said recycled water. Once recycled water becomes available, customers shall be notified and sales shall resume as the Department is able to do so, at the then current rate.

SECTION 5. The fees and charges set forth herein shall become effective on October 1, 2019, and shall be adjusted as set forth in Sections 2 and 3 hereof. All resolutions or administrative actions by the City Council, or parts thereof that are inconsistent with any provision of this Resolution are hereby superseded only to the extent of such inconsistency.

SECTION 6. The City Clerk shall attest and certify to the passage and adoption of this Resolution.

PASSED, APPROVED AND ADOPTED this 16th day of September, 2019.

CITY OF POMONA:

Tim Sandoval
Mayor

APPROVED AS TO FORM:

Sonia Carvalho Reso 2019-128

Sonia Carvalho
City Attorney

ATTEST:

Rosalia A. Butler, MMC
City Clerk

I, HEREBY CERTIFY that the foregoing resolution was duly adopted by the City Council of the City of Pomona at a regular meeting thereof held on September 16, 2019 by the following vote of the Council:

AYES:	Garcia, Gonzalez, Lustro, Ontiveros-Cole, Preciado, Torres, Sandoval
NOES:	None
ABSTAIN:	None
ABSENT:	None

Rosalia A. Butler, MMC
City Clerk

EXECUTIVE ORDER

The fees set by Resolution No. 2019-128 have been set in compliance with Division 5 of Chapter 2 of the Pomona City Code pertaining to the fixing of regulatory fees and service charges. Pursuant to Section 2-924(d) of the Pomona City Code, the fee schedule set by Resolution No. 2019-128 shall take effect ten (10) days after the signing of an Executive Order if no written appeal has been filed.

for

Mayor Tim Sandoval

Date: Sep. 18, 2019

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

E

2025 RUWMP Part 4
GSWC - Claremont
Appendix E

E1: UWMP Compliance Checklist

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Part 2 Chapter 5 Part 1 Chapter 3
x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Part 2 Chapter 5 Executive Summary
x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Part 2 Chapter 5
x	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Part 2 Chapter 5 Section 2.1
x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Part 2 Chapter 5
x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Part 2 Chapter 5
x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Part 2 Chapter 5 Section 9 Part 4 Appendix E-2
x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Part 4 Appendix E-2
x	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Part 1 Chapter 5
n/a	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	n/a
x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Part 2 Chapter 5 Section 1.1
x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Part 2 Chapter 5 Section 1.1
x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Part 2 Chapter 5 Section 1.1
x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Part 2 Chapter 5 Section 1.1
x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area…include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Part 2 Chapter 5 Section 1.1
x	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Part 2 Chapter 5 Section 2
x	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Part 2 Chapter 5 Section 2.1.3
x	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Part 2 Chapter 5 Section 2.1.3
x	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Part 2 Chapter 5 Section 2.3
x	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Part 2 Chapter 5 Section 2.2

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Part 2 Chapter 5 Section 2.2
x	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall…Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Part 2 Chapter 5 Section 2
x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Part 2 Chapter 5 Section 2.4 Part 1 Chapter 5
n/a	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	n/a
x	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Part 2 Chapter 5 Section 3
x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Part 2 Chapter 5 Section 4 Part 1 Chapter 3
x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Part 2 Chapter 5 Section 4 Part 2 Chapter 5 Section 5.3 Part 1 Chapter 5 Section 2
x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water…(include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Part 2 Chapter 5 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Part 2 Chapter 5 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Part 2 Chapter 5 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Part 2 Chapter 5 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins…(include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Part 2 Chapter 5 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins…describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Part 2 Chapter 5 Section 4.2 Part 1 Chapter 3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water... (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Part 2 Chapter 5 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Part 2 Chapter 5 Section 4.8
x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Part 2 Chapter 5 Section 4.8 Part 1 Chapter 3 Part 1 Chapter 5
x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Part 2 Chapter 5 Section 4.6
x	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Part 2 Chapter 5 Section 4.5
x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Part 2 Chapter 5 Section 4.5
x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Part 2 Chapter 5 Section 4.5.1
x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Part 2 Chapter 5 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Part 2 Chapter 5 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Part 1 Chapter Section 5
x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Part 1 Chapter 3 Section 8
x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Part 2 Chapter 1 Section 4.7 Part 1 Chapter 3 Section 9
x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Part 2 Chapter 5 Section 4.9 Part 4 Appendix E
x	7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Part 2 Chapter 5 Section 5 Part 1 Chapter 3
x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Part 2 Chapter 5 Section 5.3 Part 1 Chapter 5 Section 2
x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Part 1 Chapter 3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Part 2 Chapter 5 Section 2.4 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Part 2 Chapter 5 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Part 2 Chapter 5 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Part 2 Chapter 5 Section 5.1 Part 1 Chapter 5
x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Part 4 Appendix E-7
x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Part 4 Appendix E-7
x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Part 4 Appendix E-7
x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Part 4 Appendix E-7
x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Part 4 Appendix E-7
x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Part 4 Appendix E-7
x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Part 4 Appendix E-7
x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix E-7

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. Water Shortage Emergencies.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, Excessive Residential Water Use During Drought.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Part 4 Appendix E-7
x	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Part 2 Chapter 5 Section 8
n/a	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	n/a
x	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9
x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Part 2 Chapter 5 Section 9 Part 4 Appendix E-2
x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9
x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix E-3
x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Part 4 Appendix E-3
x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix E-3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9
x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9
x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9
x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9
x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9
x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9
x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 5 Section 9

E2: Public Outreach

E2: Attachment 1 – 60 Day Notices

Document will be provided upon request through our contact us page.

E2: Attachment 2 – Regional Workshop #1 Materials

Document will be provided upon request through our contact us page.

E2: Attachment 3 – Regional Workshop #2 Materials

Document will be provided upon request through our contact us page.

E3: Adoption Resolution

Notice of Adoption

A meeting to solicit public comments on the 2025 Urban Water Management Plan and 2025 Water Shortage Contingency Plan for the Golden State Water Company Claremont System was held on May 26, 2026 at 11:00 a.m. via Microsoft Teams Webinar. Notice of this meeting was published in accordance with Section 6066 of the Government Code in the Inland Valley Daily Bulletin on May 12 and May 19, 2026.

Copies of the Urban Water Management Plan and Water Storage Contingency Plan were made available to the public on its website (gswater.com) prior to the public hearing.

Golden State Water Company, hereby, adopts the 2025 Urban Water Management Plan and 2025 Water Shortage Contingency Plan for the Claremont System.

Patrick M. Kubiak

Digitally signed by Patrick M. Kubiak
Date: 2026.05.28 09:30:55 -07'00'

Patrick Kubiak
Vice President, Asset Management
Golden State Water Company
_____, 2026

E4: Ordinances and Rules

The following ordinances and rules are available online. Select the links below to view:

- Ordinance No. 2009-10
- Ordinance No. 2010-02
- Rule No. 14.1 Water Conservation and Reduction Plan
- Schedule No. 14.1 Water Shortage Contingency Plan
- Schedule No. 14.1-CM will be provided on request through our contact us webpage.
- Rule No. 20

E5: DWR Tables

Submittal Table 2-1 Retail: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
CA1910024	GSWC - Claremont	11,540	8,973
	Total	11,540	8,973

Submittal Table 2-2: Plan Identification

Type of Plan	Name of Regional Alliance or RUWMP
Individual UWMP	Three Valleys Regional Urban Water Management Plan

Submittal Table 2-3: Supplier Identification

Type of Supplier	Year Type	Month and date that the year begins (mm/dd)	Units of measure used in UWMP
Supplier is a retail supplier	Calendar Year	01/01	AF

Submittal Table 2-4 Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use.
Wholesale Water Supplier Name
Three Valleys Municipal Water District

Submittal Table 3-1 Retail: Population - Current and Projected

Category	2025	2030	2035	2040	2045	2050*(opt)*
Population Served	40,637	41,169	41,702	41,687	41,671	41,656

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual

Use Type	Additional Description (as needed)	2025 Actual Water Use Potable or Non-Potable	2025 Actual Water Use Volume (AF)
Single Family		Potable	4,767
Multi-Family		Potable	627
Commercial		Potable	2,430
Landscape		Potable	724
Distribution System Water Loss		Potable	424
		Subtotal Potable	8972
		Subtotal Non-Potable	0
		Total	**8,972**

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected

Use Type	Additional Description	Projected Water Use Potable or Non-Potable (Optional)	Projected Water Use 2030 (AF)	Projected Water Use 2035 (AF)	Projected Water Use 2040 (AF)	Projected Water Use 2045 (AF)	Projected Water Use 2050 opt (AF)
Single Family		Potable	5,302	5,157	4,974	4,802	4,642
Multi-Family		Potable	719	699	674	651	629
Commercial		Potable	2,645	2,572	2,481	2,395	2,315
Landscape		Potable	717	697	672	649	628
Distribution System Water Loss		Potable	491	477	460	444	430
Subtotal Potable			9,874	9,602	9,261	8,941	8,644
Subtotal Non-Potable			0	0	0	0	0
Total			**9,874**	**9,602**	**9,261**	**8,941**	**8,644**

Submittal Table 4-3 Retail: Inclusion in Water Use Projections

Projection Item	Included in Projections?
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included In Projections?	Yes

Submittal Table 4-5 Retail: Water Loss Audit Reporting

Public Water System ID #	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910024	2020	Yes
CA1910024	2021	Yes
CA1910024	2022	Yes
CA1910024	2023	Yes
CA1910024	2024	Yes

Notes: The "Volume of Water Loss" quantities for CY 2020 through CY 2024 were obtained from the annual AWWA Water Loss Audits (and based on the combination of apparent losses and real losses). The AWWA Water Loss Audits were reported on a calendar year basis.

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard

Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System?	Real Water Loss State Water Board Standard 2028 Real Water Loss Standard per Unit per day	Real Water Loss State Water Board Standard Units for Real Water Loss	Real Water Loss Most Recent AWWA Water Loss Audit Number of Units (Connections or Miles corresponding with units selected)	Real Water Loss Most Recent AWWA Water Loss Audit Volume of Total Real Loss (AF) (from AWWA Water Loss Audit)	Real Water Loss Per Unit per Day	Apparent Water Loss State Water Board Standard 2028 Apparent Water Loss Standard per Unit per Day	Apparent Water Loss State Water Board Standard Units for Apparent Water Loss	Apparent Water Loss Most Recent AWWA Water Loss Audit Number of Connections	Apparent Water Loss Most Recent AWWA Water Loss Audit Volume of Total Apparent Loss (AF) (from AWWA Water Loss Audit)	Apparent Water Loss Per Unit per Day
CA1910024	Yes	45.6	Gallons per Service Connection per Day (GPSCD)	11,531	276	21.4	4.9	Gallons per Service Connection per Day (GPSCD)	11,531	152	11.8

Water Board's Calculated Water Loss Standards

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress

Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target?	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Actual 2025 GPCD (From SB X7-7 Compliance Form) *	Did Supplier meet the 2020 Target in 2025? *
n/a	n/a	265	247	Yes	197	Yes

Notes: n/a=Not Applicable

***** Only for suppliers that did not meet the Target in 2020

Submittal Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type	Potable or Non-Potable (OPTIONAL)	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Alluvial Basin	Potable	Six Basins	4,143	4,150	3,286	2,908	3,389
Alluvial Basin	Potable	Chino Basin	1,073	1,065	921	990	938
		Total	**5,216**	**5,215**	**4,207**	**3,898**	**4,327**

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area

Wastewater Collection Name of Wastewater Collection Agency	Wastewater Collection Wastewater Volume Metered or Estimated? Optional	Wastewater Collection Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Recipient of Collected Wastewater Name of Wastewater Treatment Plant (WWTP) and Place ID Number	Recipient of Collected Wastewater Is WWTP Located Within UWMP Area?
Sanitation Districts of Los Angeles County	Estimated	2,139	Pomona Water Reclamation Plant, Place ID 250700	No
Sanitation Districts of Los Angeles County	Estimated		A.K. Warren Water Resource Facility, Place ID 234156	No
	Total Wastewater Received from UWMP Service Area in 2025:	**2,139**		

Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (Optional)	2025 Volume of Wastewater Received from UWMP Service Area (AF)	Total 2025 Volume of Water Treated (AF)	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Treatment Level	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Volume (AF)	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Treatment Level	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Treatment Level	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Name of other entity
Total		**0**	**0**		**0**		**0**		**0**		**0**		**0**	

Notes: Wastewater was not treated or disposed of within the UWMP service area; therefore, this table was intentionally left blank.

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

Use Type	Potable or Non-Potable (after treatment if treated) (Optional)	Additional Information	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use Volume	Potential Recycled Water Use Narrative page number (Optional)
		Subtotal Potable	0	0	0	0	0	0	0	
		Subtotal Non-Potable	0	0	0	0	0	0	0	
		Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Notes: Recycled water is currently not used and not planned for use within the service area of the supplier; therefore, this table was intentionally left blank.

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual

Use Type	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Total	**0**	**0**

Notes: Recycled water was not used in 2025 nor previously projected for use in 2020; therefore, this table was intentionally left blank.

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
		Total (AF)	**0**
		Unit Conversion to AF	**0**

Notes: The Supplier does not plan to expand recycled water use in the future; therefore, this table was intentionally left blank, and a narrative explanation is provided in Section 4.5.1 of the UWMP.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other suppliers?	If Yes, Supplier Name	Additional Description	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AF)

Notes: There are future water supply projects or programs not compatible with this table; therefore, are described in narrative form in Section 4.7 of the UWMP**.**

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Description	2025 Potable or Non-Potable (after treatment if treated) (Optional)	2025 Actual Volume (AF)	2025 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Chino Basin	Potable	938	
Groundwater (not desalinated)	Six Basins	Potable	3,389	
Purchased or Imported Water	City of Upland	Potable	0	
Purchased or Imported Water	Metropolitan Water District - Three Valley Municipal Water District	Potable	4,645	
		Subtotal Potable	8,972	0
		Subtotal Non-Potable	0	0
		Total	**8,972**	**0**

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Projected Water Supply 2030 Reasonably Available Volume (AF)	Projected Water Supply 2030 Total Entitlement (AF) (Optional)	Projected Water Supply 2035 Reasonably Available Volume (AF)	Projected Water Supply 2035 Total Entitlement (AF) (Optional)	Projected Water Supply 2040 Reasonably Available Volume (AF)	Projected Water Supply 2040 Total Entitlement (AF) (Optional)	Projected Water Supply 2045 Reasonably Available Volume (AF)	Projected Water Supply 2045 Total Entitlement (AF) (Optional)	Projected Water Supply 2050 Reasonably Available Volume (AF)	Projected Water Supply 2050 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Chino Basin	Potable	1,003		990		981		973		965	
Groundwater (not desalinated)	Six Basins	Potable	3,590		3,544		3,511		3,483		3,454	
Purchased or Imported Water	Metropolitan Water District - Three Valley Municipal Water District	Potable	5,280		5,069		4,769		4,485		4,224	
Purchased or Imported Water	City of Upland	Potable	0		0		0		0		0	
		Subtotal Potable	9,873	0	9,603	0	9,261	0	8,941	0	8,643	0
		Subtotal Non-Potable	0	0	0	0	0	0	0	0	0	0
		Total	**9,873**	**0**	**9,603**	**0**	**9,261**	**0**	**8,941**	**0**	**8,643**	**0**

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year	Volume Available (AF)	Percent of Average Supply
Average Year	2021-2025	8,635	100%
Single-Dry Year	2021	10,370	120%
Consecutive Dry Years 1st Year	2018	9,979	116%
Consecutive Dry Years 2nd Year	2019	9,214	107%
Consecutive Dry Years 3rd Year	2020	10,175	118%
Consecutive Dry Years 4th Year	2021	10,370	120%
Consecutive Dry Years 5th Year	2022	9,460	110%

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	9,873	9,603	9,262	8,941	8,644
Use totals	9,873	9,603	9,262	8,941	8,644
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	11,857	11,533	11,123	10,738	10,381
Use totals	11,857	11,533	11,123	10,738	10,381
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison

Year	Total Type / Difference	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	11,410	11,098	10,704	10,333	9,990
	Use totals	11,410	11,098	10,704	10,333	9,990
	Difference	**0**	**0**	**0**	**0**	**0**
Second year	Supply totals	10,536	10,247	9,884	9,541	9,224
	Use totals	10,536	10,247	9,884	9,541	9,224
	Difference	**0**	**0**	**0**	**0**	**0**
Third year	Supply totals	11,634	11,316	10,914	10,536	10,186
	Use totals	11,634	11,316	10,914	10,536	10,186
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth year	Supply totals	11,857	11,533	11,123	10,738	10,381
	Use totals	11,857	11,533	11,123	10,738	10,381
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth year	Supply totals	10,817	10,521	10,148	9,796	9,471
	Use totals	10,817	10,521	10,148	9,796	9,471
	Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment

Totals	2026	2027	2028	2029	2030
Total Water Use (AF)	11,410	10,536	11,634	11,857	10,817
Total Supplies (AF)	11,410	10,536	11,634	11,857	10,817
Difference w/o WSCP Action (AF)	**0**	**0**	**0**	**0**	**0**

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		

Notes: The Supplier uses the standard six levels of water shortage; therefore, supplier-specific shortage levels and percentage ranges are not separately identified in this table.

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (Percentage)	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)
1	Transfers		Not applicable (see notes)	
2	Transfers		Not applicable (see notes)	
3	Transfers		Not applicable (see notes)	
4	Transfers		Not applicable (see notes)	
5	Transfers		Not applicable (see notes)	
6	Transfers		Not applicable (see notes)	

Notes: GSWC will consider increased production from Six Basins and the Chino Basin using existing facilities to address increased demands. GSWC plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

Submittal Table 8-3 Retail: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 1 actions is up to 1,163 AFY	Maximum 2 days a week.	Yes	1
1	Landscape - Limit landscape irrigation to specific times	Collective reduction from all Shortage Level 1 actions is up to 1,163 AFY	Between 7 p.m. and 8 a.m.	Yes	1
2	Other	Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 2,327 AFY	All actions under Shortage Level 1	Yes	2
2	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 2 actions is up to 2,327 AFY	All use in excess of allocation will be charged regular rate + $2.50/CCF	Yes	2
3	Other	Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 3,490 AFY	All actions under Shortage Level 2	Yes	3
4	Other	Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 4,654 AFY	All actions under Shortage Level 3	Yes	4
4	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 4 actions is up to 4,654 AFY	All use in excess of allocation will be charged regular rate + $5.00/CCF	Yes	4

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
5	Other	Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 5,817 AFY	All actions under Shortage Level 4	Yes	5
6	Other	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 5,817 AFY	All actions under Shortage Level 5	Yes	6
6	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from Shortage Level 6 actions is greater than 5,817 AFY	All use in excess of allocation will be charged regular rate + $10.00/CCF	Yes	6

Submittal Table 10-1 Retail: Notification to Cities and Counties

City or County Name	60 Day Notice	Notice of Public Hearing
Claremont	Yes	Yes
Montclair	Yes	Yes
Pomona	Yes	Yes
Upland	Yes	Yes
Los Angeles County	Yes	Yes

E6: AWWA Water Audits

The following AWWA Water Audit reports are available online. Select the links below to view each report:

- 2020 AWWA Water Audit
- 2021 AWWA Water Audit
- 2022 AWWA Water Audit
- 2023 AWWA Water Audit
- 2024 AWWA Water Audit

If a link is not available, AWWA Water Audit reports for all years can be downloaded from the WUEdata website.

E7: Water Shortage Contingency Plan

E7: Attachment 1 – Water Shortage Contingency Plan Adoption Resolution

Notice of Adoption

A meeting to solicit public comments on the 2025 Urban Water Management Plan and 2025 Water Shortage Contingency Plan for the Golden State Water Company Claremont System was held on May 26, 2026 at 11:00 a.m. via Microsoft Teams Webinar. Notice of this meeting was published in accordance with Section 6066 of the Government Code in the Inland Valley Daily Bulletin on May 12 and May 19, 2026.

Copies of the Urban Water Management Plan and Water Storage Contingency Plan were made available to the public on its website (gswater.com) prior to the public hearing.

Golden State Water Company, hereby, adopts the 2025 Urban Water Management Plan and 2025 Water Shortage Contingency Plan for the Claremont System.

Patrick M. Kubiak

Digitally signed by Patrick M. Kubiak
Date: 2026.05.28 09:30:55 -07'00'

Patrick Kubiak
Vice President, Asset Management
Golden State Water Company
_____, 2026

E7: Attachment 2 – Water Shortage Contingency Plan

2025 WATER SHORTAGE CONTINGENCY PLAN

GOLDEN STATE WATER COMPANY - CLAREMONT

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AF	Acre-Foot
AFY	Acre-Feet per Year
CCF	Hundred Cubic Feet
CPUC	California Public Utilities Commission
CWC	California Water Code
DWA	Division of Water and Audits
DWR	California Department of Water Resources
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
GSWC	Golden State Water Company
MWD	Metropolitan Water District of Southern California
RRA	Risk and Resilience Assessment
TVMWD	Three Valleys Municipal Water District
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan

WATER SHORTAGE CONTINGENCY PLAN

WATER SHORTAGE CONTINGENCY PLAN

Golden State Water Company – Claremont's (GSWC) 2025 Water Shortage Contingency Plan (WSCP) discusses and provides the following:

- GSWC's WSCP is a detailed approach which presents how GSWC intends to act, or respond, in the case of an actual water shortage.
- Preparation of GSWC's "Annual Water Supply and Demand Assessment" (Annual Assessment) is discussed. Beginning July 1, 2022, GSWC has submitted the Annual Assessment each year through 2025. The Annual Assessment includes a review of GSWC's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent GSWC's water demands prior to any "response actions" GSWC may invoke pursuant to GSWC's WSCP.
- GSWC will manage water supplies to minimize the adverse impacts of water shortages. GSWC's plan for water usage during periods of shortage is designed to address six standard progressive water shortage levels including up to a 10, 20, 30, 40, and 50 percent shortage, and a greater than a 50 percent shortage.
- For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level.
- For each declared water supply shortage level, GSWC has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.
- The operational changes GSWC will consider in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and

tracking of customer water usage to enforce demand reduction measures.

- GSWC's Emergency Response Plan (ERP) is summarized. The ERP provides the management, procedures, and designated actions GSWC and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of GSWC's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of GSWC's water service area are provided.
- The effectiveness of the shortage response actions for each of GSWC's standard water shortage levels is presented. GSWC has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands.
- The communication protocols implemented by GSWC when it declares any water shortage level are presented.
- The compliance and enforcement procedures associated with GSWC's standard water shortage levels are presented.
- The legal authorities associated with GSWC's standard water shortage levels are presented.
- The financial consequences associated with GSWC's standard water shortage levels are presented.
- GSWC will evaluate the need for revising the WSCP to resolve any water shortage gaps, as necessary. The steps necessary for GSWC to adopt and amend its WSCP are presented.

The following WSCP includes references to Chapters and Sections from Golden State Water Company – Claremont's 2025 Urban Water Management Plan:

1 WATER SUPPLY RELIABILITY ANALYSIS

CWC 10632.

(a)(1) The analysis of water supply reliability conducted pursuant to Section 10635.

GSWC's sources of supply were discussed in Chapter 4 of the 2025 UWMP and consist of groundwater from Six Basins, groundwater from Chino Basin, and treated imported water purchased from Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD) and treated purchased water from City of Upland. Both Six Basins and Chino Basin are adjudicated, and groundwater supplies are managed. The reliability of the various sources of supply are discussed in Chapter 5 of the 2025 UWMP. Based on the adjudication provisions in the two groundwater basins, GSWC is able to produce groundwater without limitation, provided an applicable assessment is paid to the respective Watermaster service to purchase untreated imported water for groundwater replenishment. Imported water supplies (both treated and untreated) may be impacted in the event MWD implements its Water Supply Allocation Plan (WSAP) due to a water supply shortage.

2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

CWC 10632.

(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

CWC 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

Beginning July 1, 2022, GSWC has submitted an Annual Assessment in accordance with California Department of Water Resources' (DWR) guidance and requirements. The Annual Assessment includes a review of GSWC's unconstrained water demands

(i.e., water demands prior to any projected response actions GSWC may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. GSWC also includes information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the GSWC's WSCP.

For each Annual Assessment, GSWC prepares a preliminary assessment which evaluates the adequacy of its water supplies for the current and upcoming years by April of each year. The preliminary assessment includes a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

2.1 DECISION MAKING PROCESS

GSWC produces groundwater from Six Basins and Chino Basin as its primary sources of water supply and these basins are managed on a fiscal year basis. Consequently, during the third quarter of each fiscal year, GSWC reviews its water demands from the initial six months along with the current groundwater basin conditions and local hydrology. This information is used to help develop the Annual Assessment. A draft of the Annual Assessment is circulated internally within GSWC for peer review and comment. Based on comments received, a redraft is prepared and provided to GSWC managers during the spring of each year. The draft is then provided to the General Manager for final review. Subsequently, a final draft of the Annual Assessment is provided to the GSWC's Board of Directors for review and included in the agenda as part of a Board meeting such that it can be approved and any recommended specific shortage response actions may be enacted. The final Annual Assessment is provided to DWR no later than July 1 of each year.

The Annual Assessments are instrumental in providing guidance to GSWC for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process ensures adequate water supplies resources are available to GSWC.

2.2 DATA AND METHODOLOGIES

The key data inputs and methodologies which evaluated by GSWC during the preparation of the preliminary assessment include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment are identified. The evaluation criteria includes, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels), current water demands, a review of water system improvement plans which may impact infrastructure availability, and water quality regulations which may impact groundwater availability. GSWC compares total demand to total supply to identify potential shortages. If shortages are identified, GSWC will determine the necessary WSCP level and corresponding reduction.

2) Water Supply: A description and available volume of each available water supply source is provided. The descriptions includes a quantification of each available water supply source and is based on review of current production capacities, historical production, UWMPs, and prior water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, are reviewed and calculated as necessary. The review includes factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban

Water Supplier Reports, existing water shortage levels (see Section 3), and existing water conservation ordinances (see Section 8.1.1 of the UWMP).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands during the current year and the upcoming (potential single dry) year are considered and identified for each source of supply. The evaluation includes factors such as estimated water demands, weather, groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.

5) Infrastructure Considerations: The capabilities of the water distribution system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year are considered. Available production capacities (e.g., groundwater well capacities) and distribution system water losses (see Section 2.1.2 of the UWMP) are reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see Section 4.7 of the UWMP), are considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies are described.

3 SIX STANDARD WATER SHORTAGE LEVELS

CWC 10632.

(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph

(A) by developing and including a cross reference relating its existing categories to the six standard water shortage levels.

GSWC will manage water supplies prudently to minimize the adverse impacts of water shortages. GSWC's plan for water usage during periods of shortage is designed to incorporate six standard water shortage levels corresponding to progressive ranges from up to a 10, 20, 30, 40, and 50 percent shortage, and greater than a 50 percent shortage.

For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level. GSWC will identify the year to be used for establishing the customer baseline water use.

California Public Utilities Commission's (CPUC) Rule No. 14.1 ("Water Conservation and Rationing Plan"), adopted on November 3, 2022, and Schedule No. 14.1 ("Water Shortage Contingency Plan With Staged Mandatory Reductions And Drought Surcharges"), adopted on March 1, 2025 established six (6) water shortage levels. A copy of Rule 14.1 and Schedule 14.1 is provided in Appendix A. In accordance with the CWC in which urban water suppliers are required to define six standard water shortage levels, GSWC updated its Schedule No. 14.1 to reflect the mandated shortage levels.

GSWC's 2025 Mandated Shortage Levels

2025 Standard Level	Shortage Level
1	< 10%
2	10 to 20%
3	20 to 30%
4	30 to 40%
5	20 to 50%
6	>50 %

Note: The 2020 shortage levels have remained the same for 2025.

Table 1 provides a description of the six water shortage levels, which may be triggered by a shortage in one or more of GSWC's water supply sources, depending on the severity of the shortage and its anticipated duration.

Table 1. Water Shortage Contingency Planning Levels

Submittal Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions (*Narrative description*)**
1	Up to 10%	"Water Alert" – Voluntary conservation is encouraged. GSWC Implements voluntary conservation measures authorized under Rule No. 14.1. Establishes a voluntary demand reduction target for each water system. GSWC informs public of water shortage conditions or demand reduction targets, GSWC identifies the year to be used for establishing the customer baseline water use. Recommend voluntary 3-Day outdoor irrigation between the hours of 7 PM and 8 AM per specified schedule. GSWC may change the number of watering days and the specific days of watering after notification in accordance with CPUC Rule 14.1.
2	Up to 20%	20% Mandatory Reduction Stage – "Moderate Shortage" - In addition to all actions in Shortage Level 1, Outdoor irrigation is restricted to two (2) days per week per established schedule. GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 20%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $2.50 per CCF Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.
3	Up to 30%	30% Mandatory Reduction Stage – "Severe Shortage" - In addition to actions in Shortage Level 2, GSWC calculates customer conservation allocation based upon year identified in Stage 1, less 30%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $5.00 per CCF. Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.
4	Up to 40%	40% Mandatory Reduction Stage – "Critical Shortage" - In addition to actions in Shortage Level 3, GSWC calculates customer conservation allocation based upon year identified in Stage 1, less 40%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $7.50 per CCF. Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.
5	Up to 50%	50% Mandatory Reduction Stage – "Shortage Crisis" - In addition to actions in Shortage Level 4, GSWC calculates customer conservation allocation based upon year identified in Stage 1, less 50%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $10.00 per CCF. Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.

Submittal Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions (*Narrative description)***
6	>50%	55% Mandatory Reduction Stage – "Emergency Shortage" - In addition to actions in Shortage Level 5, GSWC calculates customer conservation allocation based upon year identified in Stage 1, less 55%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $15.00 per CCF. Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.

NOTES: Flow Restrictor Charges – The charge for installation and removal of a flow-restricting device shall be:
5/8" to 1" - $150
1-1/2" to 2" $200
3" and larger - $300

4 SHORTAGE RESPONSE ACTIONS

CWC 10632.

(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

Shortage response actions are dependent on the severity of a declared shortage level. Response actions implement varying improvements and regulations of system infrastructure and operations, water supply augmentation, demand reduction initiatives and other water use functions to conserve water supplies.

GSWC is an investor-owned supplier and is subject to CPUC approval to establish and activate necessary shortage response actions and corresponding water shortage levels pursuant to CPUC Rule 14.1 (“Water Conservation and Rationing Plan”). GSWC may express a need for customers to practice voluntary or mandatory conservation measures. If GSWC finds it necessary, GSWC may request to activate a water shortage level which would implement fines and surcharges in addition to mandatory conservation measures after establishing a CPUC Schedule No. 14.1 (“Water Shortage Contingency Plan With Staged Mandatory Restrictions, Reductions And Drought Surcharges”). Copies of these CPUC documents are in Appendix A.

4.1 DEMAND REDUCTION

GSWC may establish water shortage response actions to reduce demand on water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions. Depending on the percent reduction in GSWC's water supply and corresponding water shortage level, regulations are made to conserve water and reduce the shortage gap in normal supply levels. Many demand reduction actions, identified as voluntary or mandatory conservation measures, are applicable to all levels of water shortages. The structure of water shortage levels are designed to encourage customers with high gallon per capita usage to achieve proportionally greater reduction than those with low usage. Violations of these demand reduction actions may be considered waste and an unreasonable use of water. Table 2 describes each demand reduction action and its effect on reducing the shortage gap.

The following demand reduction actions may be activated under voluntary or mandatory conservation measures and are applicable and in effect at all times during any activated water shortage level:

a. The application of potable water to outdoor landscapes in a manner that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.

b. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

c. The use of potable water for washing buildings, structures, sidewalks, walkways, patios, tennis courts, or other hard-surfaced, non-porous areas.

d. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.

e. The use of potable water for watering outside plants, lawn, landscape, and turf

area during certain hours prohibited by applicable laws or rules, during and up to 48 hours after measurable rainfall (0.1" or more).

f. GSWC will promptly notify customers when aware of leaks within the customer's control; the failure to repair any leaks, breaks, or other malfunction resulting in water waste in a customer's domestic or outdoor water system within forty-eight (48) hours of notification by the utility, unless other, specific arrangements are made with and agreed to by the utility.

g. The serving of water, other than upon request, in eating and drinking establishments, including but not limited to restaurants, hotels, cafes, bars, or other public places where food or drink are served and/or purchased.

h. Hotels/motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.

i. The use of potable water for irrigation of ornamental turf on public street medians.

j. The use of potable water for irrigation outside of newly constructed homes and buildings that is not delivered by drip or micro spray systems.

k. Commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water use in an amount consistent with the mandated reduction.

l. Further reduction in or the complete prohibition of any other use of water declared non-essential, unauthorized, prohibited, or unlawful by an authorized government or regulatory agency or official.

m. Use of potable water for watering streets with trucks, or other vehicles, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.

n. The outdoor irrigation restriction does not apply to trees or edible vegetation

watered solely by drip or micro spray systems.

o. The use of potable water is prohibited for the irrigation of non-functional turf at commercial, industrial and institutional sites.

- Use of potable water for more than minimal landscaping, as defined in the landscaping regulation of the jurisdiction or as described in Article 10.8 of the California Government Code in connection with new construction.
- Excessive use of water when a utility has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering, or irrigation system and the customer has failed to make such repairs within five (5) business days.
- Use of potable water which results in flooding or runoff in gutters or streets.
- Individual private washing of cars with a hose except with the use of a positive action shut-off nozzle. Use of potable water for washing commercial aircraft, cars, buses, boats, trailers, or other commercial vehicles at any time, except at commercial or fleet vehicle or boat washing facilities operated at a fixed location where equipment using water is properly maintained to avoid wasteful use.
- Use of potable water to wash buildings, structures, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas, except in the cases where health and safety are at risk.
- Use of potable water to irrigate turf lawns, gardens, or ornamental landscaping by means other than drip irrigation, or hand watering without quick acting positive action shut-off nozzles, on a specific schedule, for example: 1) between 7 p.m. and 8 a.m.; 2) every other day; or 3) selected days of the week.
- Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
- Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

- Use of potable water for construction purposes unless no other source of water or method can be used.
- Use of potable water for street cleaning.
- Operation of commercial car washes must ensure that at least 50 percent of the potable water used per cycle is recycled.
- Use of potable water for watering outside plants, lawn, landscape, and turf areas during certain hours if and when specified in Schedule 14.1.
- Use of potable water for decorative fountains or the filling or topping off of decorative lakes or ponds which utilize recycled water.
- Serving water in any restaurant except upon the request of a patron.
- Use of potable water to flush hydrants, except where required for public health or safety.

Stage 1 – Voluntary Conservation "Water Alert":

Recommended voluntary outdoor irrigation – Three (3) days per week:

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Sunday, Wednesday, Friday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday, Thursday, Saturday

Additional actions:

- GSWC will establish a voluntary demand reduction target for each water system.
- All outdoor irrigation must occur between the hours of 7 p.m. and 8 a.m.
- If a city, county, or other public agency adopts restrictions on the number of days or hours of the day that customers may irrigate, GSWC, at its discretion, may adopt and enforce those restrictions.

If conditions warrant, GSWC will change the number of watering days and the specific days of watering after first notifying its customers in accordance with Rule 14.1.

Stage 2 – 20% Mandatory Reduction Stage "Moderate Shortage"

In addition to the restrictions identified in Stage 1 Voluntary Conservation "Water Alert", the following allocations and drought emergency surcharges are in effect:

- Outdoor Irrigation is restricted to two (2) days per week based on the irrigation schedule set in Schedule 14.1.
- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 20%
- For residential customers, no allocation will be set less than eight hundred cubic feet (8 CCF) per monthly billing period or sixteen (16) CCF per bi-monthly billing period.
- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $2.50 per CCF.

Stage 3 – 30% Mandatory Reduction Stage "Severe Shortage":

In addition to the restrictions identified in Stage 2 – 20% Mandatory Reduction Stage "Moderate Shortage", the following allocations and drought emergency surcharges are in effect:

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 30%
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency.
- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $5.00 per CCF

Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C of Schedule 14.1.Stage 4 – 40% Mandatory Reduction Stage "Critical Shortage"

In addition to the restrictions identified in Stage 3 - 30% Mandatory Reduction Stage "Severe Shortage", the following allocations and drought emergency surcharges are in effect:

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 40%
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency.
- No allocation will be set less than eight (8) CCF per monthly billing period or sixteen (16) CCF per bi-monthly billing period
- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $7.50 per CCF.

Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C of Schedule 14.1.Stage 5 – 50% Mandatory Reduction

Stage "Shortage Crisis"

In addition to the restrictions identified in Stage 4 – 40% Mandatory Reduction Stage "Critical Shortage", the following allocations and drought emergency surcharges are in effect:

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 50%
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency.
- No allocation will be set less than eight (8) CCF per monthly billing period or sixteen (16) CCF per bi-monthly billing period.
- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $10.00 per CCF

Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C of Schedule 14.1.Stage 6 – 55% Mandatory Reduction Stage "Emergency Shortage":

In addition to the restrictions identified in Stage 5 – 50% Mandatory Reduction Stage "Shortage Crisis", the following allocations and drought emergency surcharges are in effect:

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 55%
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency.
- No allocation will be set less than eight (8) CCF per monthly billing period or sixteen (16) CCF per bi-monthly billing period
- All usage in excess of the customer's allocation will be charged at the regular rate

plus a drought emergency surcharge of $15.00 per CCF.

- Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C of Schedule 14.1.

Table 2. Demand Reduction Actions

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 1 actions is up to 1,163 AFY	Maximum 2 days a week.	Yes
1	Landscape - Limit landscape irrigation to specific times	Collective reduction from all Shortage Level 1 actions is up to 1,163 AFY	Between 7 p.m. and 8 a.m.	Yes
2	Other	Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 2,327 AFY	All actions under Shortage Level 1	Yes
2	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 2 actions is up to 2,327 AFY	All use in excess of allocation will be charged regular rate + $2.50/CCF	Yes
3	Other	Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 3,490 AFY	All actions under Shortage Level 2	Yes
4	Other	Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 4,654 AFY	All actions under Shortage Level 3	Yes
4	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 4 actions is up to 4,654 AFY	All use in excess of allocation will be charged regular rate + $5.00/CCF	Yes
5	Other	Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 5,817 AFY	All actions under Shortage Level 4	Yes
6	Other	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 5,817 AFY	All actions under Shortage Level 5	Yes
6	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from Shortage Level 6 actions is greater than 5,817 AFY	All use in excess of allocation will be charged regular rate + $10.00/CCF	Yes

NOTES

4.2 SUPPLY AUGMENTATION

GSWC does not plan to add a new source of water supply to address customer demands but instead will consider increased supplies from existing sources. Table 3 reflects this approach and does not identify any new supplies. Instead, GSWC will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. As discussed in Chapter 4 of the UWMP, GSWC's sources of water supply include groundwater produced from the Chino Basin and Six Basins, treated water purchased from the City of Upland, and treated imported water purchased from MWD through TVMWD. As noted in Section 2, beginning July 1, 2022, GSWC has prepared and submitted an Annual Assessment which includes a review of water supplies available to meet water demands for the current and upcoming years. In the event GSWC is currently in, or considers entering into, one of the standard water shortage levels identified in Section 3, GSWC will consider the water supply (augmentation) actions described below.

For each water shortage level discussed in Section 3, GSWC will consider supplementing its existing treated imported water supplies through increased production of groundwater supplies, to the extent possible. Due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies, including TVMWD. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its M&I retail demand. The ratio of MWD water supply drought allocation to local water supply will change based on the WSAP stage. The MWD drought allocation can be used to make Full Service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any Full Service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

In addition to the WSAP, MWD describes supply augmentation actions in its Regional 2025 UWMP, which is incorporated by reference. MWD's primary response to any gap between core supplies (from the State Water Project and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible

supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million acre-feet (AF). Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and on-going water supply and storage programs and management practices, GSWC can potentially continue relying on purchased imported water supplies from MWD through TVMWD for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 3. Water demands will be addressed through increased use of the local groundwater supplies and implementation of demand reduction measures through various stages of action.

GSWC has the flexibility to augment its existing water supplies through production of groundwater from Six Basins and the Chino Basin. As noted in Section 4.2 of the UWMP, Six Basins is managed by the Six Basins Watermaster and the Chino Basin is managed by the Chino Basin Watermaster. During the periods of management under the Six Basins Judgment and the Chino Basin Judgment, significant drought events have occurred. In each drought cycle, both the Six Basins and the Chino Basin have been managed to maintain water levels. Parties to the Six Basins Basin Judgment and Chino Basin Judgment, including GSWC, are authorized to produce groundwater in excess of their rights and pay assessments for such production to the respective Watermaster. The assessments are used to purchase untreated imported water to replenish Six Basins and the Chino Basin. The Six Basins Watermaster purchases untreated imported water to replenish the Six Basins from MWD through TVMWD. The Chino Basin Watermaster purchases untreated imported water to replenish the Chino Basin from MWD through Inland Empire Utilities Agency. In addition, groundwater quality in Six Basins and the Chino Basin is not expected to impact potable supplies or constrain supply reliability.

Groundwater quality is carefully monitored and managed by the Watermaster for each respective basin. In addition, treatment facilities in the Chino Basin have been developed at existing contamination sites to meet potable water standards and to prevent the spread of any groundwater contamination. Based on historical and on-going management practices, GSWC will use the treated imported water supply made available from MWD through TVMWD in association with each of the standard water shortage levels identified in Section 3. Water demands will be addressed through increased use of the local groundwater supplies and implementation of demand reduction measure through the various stages of action.

Table 3. Supply Augmentation and Other Actions

Submittal Table 8-2: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Transfers	Not applicable (see Notes)	
2	Transfers	Not applicable (see Notes)	
3	Transfers	Not applicable (see Notes)	
4	Transfers	Not applicable (see Notes)	
5	Transfers	Not applicable (see Notes)	
6	Transfers	Not applicable (see Notes)	

NOTES: GSWC will consider increased production from Six Basins and the Chino Basin using existing facilities to address increased demands. As noted on Table 2, GSWC plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

4.3 OPERATIONAL CHANGES

During a water supply shortage situation, GSWC will manage its water supply resources to provide sufficient water supplies capable of meeting the demands of its customers. Section 4.1 describes GSWC's water supply sources and water supply augmentation actions available. Section 4.2 describes GSWC's standard water shortage levels and associated demand reduction measures. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in short-term operational changes which are necessary to allow GSWC to utilize all available water supply sources in response to water shortage situations.

As noted in Section 2, beginning July 1, 2022, GSWC has prepared and submitted an Annual Assessment which includes a review of the water supplies available to meet water demands for the current and upcoming years. Preparation of the Annual Assessment assists GSWC in determining any potential operational changes. In addition, GSWC's standard water shortage levels and the associated demand reduction measures, in conjunction with GSWC's existing Demand Management Measures (discussed in Chapter 8 of the UWMP), will be essential to GSWC in reducing water demands during any water shortage period. The operational changes GSWC will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- Optimized production from existing available water supply sources.
- Potential use of emergency supply sources, including emergency interconnections.
- Potential blending of water supply resources.
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses.

4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by GSWC to reduce customer demands are discussed in Section 4.2. There are no additional mandatory restrictions planned at this time.

4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in GSWC's standard water shortage levels (identified in Section 3) and the associated demand reduction measures (described in Section 4.2). In addition to the water supply augmentation actions (Section 4.1) and potential operational changes (Section 4.3) which GSWC may consider in order to continue providing sufficient water supplies, GSWC will review and implement any necessary steps included in its "Emergency Response Plan".

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including GSWC, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated ERP every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States Environment Protection Agency (USEPA), confirming the current RRA and ERP have been reviewed and updated. For GSWC, the RRA certification is due by June 30, 2026, and the ERP certification is due by December 31, 2026.

GSWC's RRA, which is currently being reviewed and updated, evaluates the vulnerabilities, threats, and consequences from potential hazards to GSWC's water system. GSWC prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);

- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and
- Operation and maintenance.

GSWC's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e., associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with GSWC's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

GSWC's ERP, which is currently being reviewed and updated, provides the management, procedures, and designated actions GSWC and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances. GSWC's ERP (which is incorporated by reference) provides the guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies which directly affect the water system and the ability to maintain safe operations (such as chlorine release, an earthquake, or a threat of contamination). The ERP also incorporates the results of GSWC's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity.
- Plans and procedures for responding to a natural hazard or malevolent act.
- Actions and equipment to lessen the impact of a natural hazard or malevolent act.
- Strategies to detect natural hazards or malevolent act.

GSWC will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. GSWC will also review applicable procedures described in the

ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC 10632.5.

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

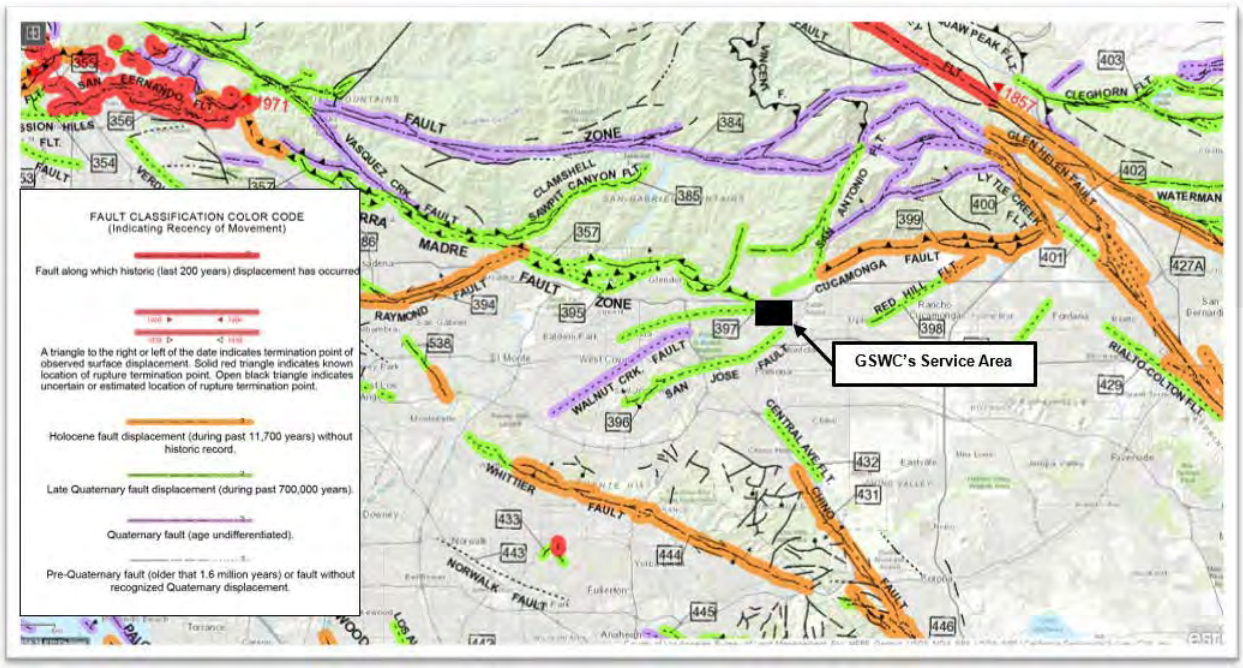
The City of Claremont (GSWC) prepared a local "Natural Hazards Mitigation Plan" which was approved by the Federal Emergency Management Agency (FEMA) in 2022. The "Natural Hazards Mitigation Plan" identifies effective ways to assess the significant natural hazards including earthquakes) that may affect GSWC and its residents. The "Natural Hazards Mitigation Plan" provides resources, information, and strategies to reduce GSWC's vulnerability to these hazards, while providing guidance for the coordination of mitigation activities throughout GSWC. The "Natural Hazards Mitigation Plan" includes mitigation projects necessary to reduce seismic risk to GSWC's water distribution system facilities (including its distribution system pipelines, groundwater wells, booster pumps, and storage reservoirs) and potential disruptions in providing water service. GSWC's "Local Hazards Mitigation Plan" is provided in Appendix B.

The County of Los Angeles prepared a "All-Hazards Mitigation Plan" in 2025 which identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Los Angeles County, and the mitigation strategies necessary to reduce

risks, including seismic risk. The County's "All-Hazards Mitigation Plan" is provided in Appendix C.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of GSWC's water service area are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in GSWC's water service area include the San Andreas fault, the Walnut Creek fault, the San Jose fault, the Red Hill fault, the Raymond fault, the Cucamonga fault, and the Sierra Madre fault.

Location of Earthquake Faults

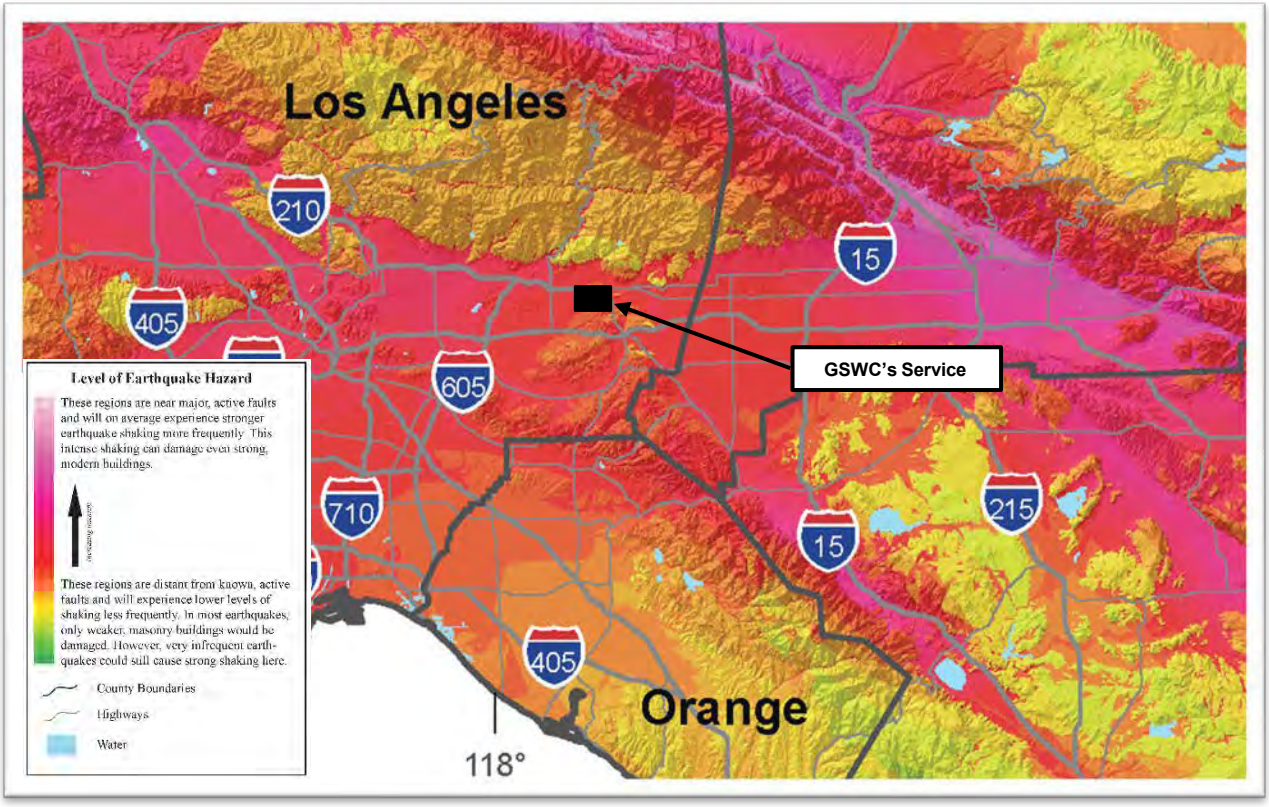


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of GSWC's service area from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including GSWC's service area, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates

with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 4.5, GSWC is preparing an Emergency Response Plan which provides the management, procedures, and designated actions GSWC and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers receive a reliable and adequate supply of potable water. GSWC's ERP is incorporated by reference.

Earthquake Shaking Potential



Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 3 is evident in GSWC's historical ability to meet its

customer's water demands in response to a water supply shortage. In addition, GSWC imposes water consumption regulations and restrictions, and supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of GSWC's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3.

During the past 5 years, GSWC experienced a consecutive two-year drought within its service area from FY 2021 to FY 2022. Throughout this extended dry year period, the GSWC's annual water production averaged 9,915 acre-feet per year (AFY). During the past five years, the average annual production was approximately 8,635 AFY, with a maximum of 10,370 AF during FY 2021. GSWC has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, GSWC has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

GSWC's water demands during the most recent five years averaged approximately 7,063 AFY of potable water. Due to conservation efforts and demand management measures (discussed in Chapter 8 of the UWMP), GSWC's recent water demands have been less than its historical water demands, including during long-term droughts. GSWC's projected water demands (during a normal year, a single dry year, and a five consecutive year drought conditions) are provided in Section 5.3 of the UWMP and are anticipated to reflect similar reductions as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. It is anticipated GSWC will be able to continue providing sufficient water supplies to its customers to meet projected water demands, including during long-term droughts. In addition, as discussed in Section 4.1, based on historical and on-going management practices, GSWC will be able to continue relying on its water supply sources from the Six Basins and Chino Basin for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 3.

GSWC previously adopted Schedule 14.1-CM in July 2015 which declared a water supply

shortage and established water-use restrictions and regulations equivalent to the standard water shortage level 1 identified in Section 3. During this Level 1 water shortage period, GSWC was able to reduce water demands by up to 10 percent and provide sufficient water supplies to its customers. Copies of Schedule 14.1-CM are provided in Appendix A.

Based on GSWC's demonstrated ability to meet water demands during past water supply shortages, the adopted water shortage levels, the adjusted operating safe yields, and water supplies during long-term droughts, it is anticipated that GSWC will be able to provide sufficient water supplies to its customers during each of its standard water shortage levels. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. GSWC will enact varying levels of its WSCP to encourage retail customers to reduce water consumption and at the same time, reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of GSWC's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction section provided in Table 2 and Table 3. The effectiveness of GSWC's shortage response actions is based on GSWC's water demands prior to 2015 (unconstrained demands). GSWC reduced its water demands in 2015 in response to the Governor's April 1, 2015 Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. During this period, GSWC was able to reduce its water demands by approximately 28 percent. This historical water demand reduction was used to estimate the extent of water use reductions for GSWC's Water Shortage Stages. GSWC's Water Shortage Levels 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

5 COMMUNICATION PROTOCOLS

CWC 10632.

(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Since July 1, 2022, GSWC has submitted an Annual Assessment in accordance with DWR's guidance and requirements. The Annual Assessment includes a review of GSWC's unconstrained water demands (i.e., water demands prior to any projected response actions GSWC may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. GSWC also includes information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with GSWC's WSCP. See Section 2 for further discussion of the Annual Assessment.

GSWC may elect to activate voluntary conservation pursuant to CPUC's Rule 14.1, described in Section 4, by notifying the Director of the CPUC's Division of Water and Audits (DWA). GSWC will notify customers through a bill insert or direct mailing.

GSWC may elect to establish mandatory conservation measures and standard water shortage levels by requesting the addition of a Schedule 14.1 tariff, through a Tier 2 advice letter to CPUC. Upon approval of establishing Schedule 14.1, GSWC may then request activation of a water shortage level via a Tier 2 advice letter to CPUC, if necessary. GSWC also may request a loss revenue memorandum account at this time. The Tier 2 advice letter to establish Schedule 14.1 includes but is not limited to:

- Applicability,
- Territory applicable to,
- A detailed description of each water shortage level,
- A detailed description of the trigger that activates each water shortage level,
- A detailed description of each water use restriction for each water shortage level,
- Water use violation levels, written warning levels, associated fines, if applicable, and exception procedures.
- Conditions for installation of a flow restrictor,
- Charges for removal of flow restrictors, and
- Special conditions.

The Tier 2 advice letter requesting activation of the established Schedule 14.1 shall include but not be limited to justification for activating a particular water shortage level and the period during which the water shortage level will be in effect. GSWC must consult CPUC's DWA staff prior to filing the advice letter in order to determine details of the public meeting. GSWC shall then notify the customer of each Tier 2 advice letter filed with CPUC and details of the associated CPUC public hearing by bill inserts or direct mailing.

Upon approval, GSWC shall notify its customers of the activation of a water shortage level by means of bill inserts or direct mailing. Notification shall take place prior to imposing any fines associated with the activated water shortage level. If activation of a water shortage level by Schedule 14.1 would occur one year or more since the public hearing associated with establishing Schedule 14.1, then GSWC shall conduct a public hearing prior to activation of the water shortage level. GSWC shall provide its customers with updates in at least every other bill regarding its water supply status and the results of the customers' conservation efforts.

Under unique circumstances where a specific requirement of this WSCP would result in undue hardship to a customer that is disproportionate to the impacts on other customers, then the customer may apply for an exemption or appeal by completing an Appeals form available online at GSWC's website or the GSWC - Claremont office. GSWC shall

respond to each request in writing.

6 COMPLIANCE AND ENFORCEMENT

CWC 10632.

(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

Any violation of this WSCP is considered a waste and an unreasonable use of water. In the event a customer is observed to be using water for any nonessential or unauthorized use as defined by this WSCP, GSWC may charge a water use violation fine in accordance with Schedule 14.1.

GSWC may, after one written warning, install a flow restricting device on the service line of any customer observed by GSWC personnel to be using water in violation of the WSCP. A flow-restricting device shall not restrict water delivery by greater than 50 percent of normal flow and shall be capable of providing the property with a minimum of 3 CCF/person/month. The restricting device may be removed only by GSWC staff, after a three-day period has elapsed, and upon payment of the appropriate removal charge as set forth in Schedule No. 14.1.

After removal of the restricting device, if any nonessential or unauthorized use of water continues, GSWC may install another flow restricting device without written notice. This device shall remain in place until water supply conditions warrant its removal and until the appropriate charge for removal has been paid to GSWC.

Any tampering with a flow restricting device by a customer can result in discontinuation of water use at GSWC's discretion.

7 LEGAL AUTHORITIES

CWC 10632.

(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

CWC Division 1, Section 350

The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

GSWC is an investor-owned supplier and is subject to CPUC approval to establish and/or activate necessary shortage response actions and corresponding water shortage levels, pursuant to CPUC Rule 14.1. GSWC is then responsible for implementing and enforcing the water shortage response actions. GSWC may update current water shortage condition response measures based on CPUC approvals and direction, state policy directives, emergency conditions, or to improve customer response.

Pursuant to GSWC's Ordinance No. 2009-10, customers are obligated to fix leaks, breaks or malfunctions in their plumbing or distribution system within five (5) days of written notice from the City or from the customer's retail water agency, including GSWC.

GSWC may declare a waters shortage emergency and implement any shortage response action deemed necessary, upon CPUC approval. Upon declaration of a water shortage

emergency, GSWC shall coordinate with the local cities and counties within their service area for the possible proclamation of a local emergency. This includes the Cities of Claremont, Montclair, and Upland, and the County of Los Angeles.

GSWC shall declare a water shortage emergency in accordance with CA Water Code CHAPTER 3 - Water Shortage Emergencies § 350 – 358. Legal authorities include California Water Code Sections 71640-71644 Article 3. Water Shortages and CA Water Code § 366 (2025) CHAPTER 3.3 - Excessive Residential Water Use During Drought.

8 FINANCIAL CONSEQUENCES OF WSCP

CWC 10632.

(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

To ensure compliance with CWC Chapter 3.3 (commencing with Section 365), additional costs may be incurred to monitor and enforce WSCP actions. These costs may vary depending on the applicable water shortage stage and the duration of the water shortage emergency.

Potential revenue reductions and expense increases associated with activated shortage response actions are regulated and tracked by CPUC memorandum accounts.

GSWC anticipates potential impacts in revenue associated with rates and surcharges. If GSWC establishes a CPUC-approved surcharge to customers to recover revenue, GSWC anticipates that the increase in rates may result in a decline of water usage. Also,

the quantity tariff rate may cause a decline in water sales and further reduction in revenue.

GSWC anticipates potential impacts in expenditures associated with operations. An increase in staff cost may be triggered by salaries and benefits for new hires required to administer and implement the WSCP. Necessary alternative sources of water supply may also increase operations and maintenance costs. Additionally, a new water supply may increase cost of supply and treatment.

Money collected through water use violation fines shall not be accounted for as income but rather booked to a memorandum account to offset authorized expenses incurred or recovery of lost revenue.

All expenses incurred to establish and/or activate Schedule 14.1-CM that have not been considered in a General Rate Case or other proceedings, shall be recoverable by GSWC, as approved by the CPUC. GSWC shall recover expenses in a separate memorandum account for disposition as directed from time to time by the CPUC.

9 MONITORING AND REPORTING

CWC 10632.

(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

GSWC's Water Loss Control Program is used to prepare the annual water loss audits and monitor water losses. GSWC's Operations Engineering Department reviews the audits to track real and apparent losses. Losses are monitored by comparing water production to sales. The Operations Engineer contracts leak detection companies to perform a survey if necessary. If the survey indicates water losses exceed water system goals, a full audit will be performed to identify water loss sources and impacts on the overall water system. Leak locations and work orders for repairs are also documented and processed for potential water use violations and future water loss control actions.

GSWC also conducts an annual review of the Master Plan to address any anticipated water shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions. Additional monitoring and reporting requirements are approved by CPUC.

10 WSCP REFINEMENT PROCEDURES

CWC 10632.

(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

GSWC's WSCP has been prepared as an adaptive management plan. As discussed in Section 9, GSWC will monitor and report on the implementation of the WSCP. GSWC will review the implementation results for any current or potential shortage gaps between water supplies and demands. GSWC will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. GSWC will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 8 of the UWMP).
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 4.2).
- Implementation of stricter enforcement actions and penalties (discussed in Section 6).
- Improvements to the water supply augmentation responses (discussed in Section 4.1), as well as any associated operational changes (discussed in Section 4.3) which may be required.
- Incorporation of additional actions recommended by GSWC staff or other interested parties.

GSWC will use the monitoring and reporting data to evaluate the ability for these potential revisions to resolve any shortage gaps which may occur within the standard water shortage levels.

This WSCP is adopted as part of GSWC's 2025 UWMP adoption process discussed in Section 9.2 of the UWMP. It is anticipated GSWC will review, revise, and adopt an updated WSCP as part of preparing its 2030 UWMP as necessary. However, GSWC will continue to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to GSWC's WSCP will include a public hearing and adoption process by the GSWC's Board (see Section 12).

11 SPECIAL WATER FEATURE DISTINCTION

CWC 10632.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

GSWC's WSCP defines "decorative water features" as water features which are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water features. As a result, GSWC's WSCP has reviewed the response actions, enforcement actions, and monitoring and reporting programs separately for decorative water features and for pools and spas, as applicable.

Please see Section 4.2. for demand reduction actions in relation to special water features.

12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

CWC 10632.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

CWC 10635.

(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

GSWC's WSCP is adopted as part of GSWC's 2025 UWMP adoption process discussed in Chapter 9 of the UWMP. The process for adopting GSWC's WSCP includes the following:

- GSWC will conduct a public hearing and make the WSCP available for public inspection.
- GSWC will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- GSWC will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- GSWC's Board will adopt the 2025 UWMP and the WSCP.
- As part of submitting the 2025 UWMP to DWR, GSWC will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2026. GSWC will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, GSWC will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

- GSWC will conduct a public hearing and make the amended WSCP available for public inspection.
- GSWC's Board will adopt the amended WSCP.
- GSWC will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.
- Within 30 days after submission of the WSCP to DWR, GSWC will provide the WSCP to any city or county within which GSWC provides water.

Additional information regarding the adoption, submittal, and availability of GSWC's WSCP (and 2025 UWMP) is provided in Chapter 9 of the UWMP.

APPENDIX A

WATER CONSERVATION ORDINANCES AND RULES

Rule No. 14.1
Water Conservation And Reduction Plan T

GENERAL INFORMATION

1. If requested by a water wholesaler or government agency or if water supplies are projected to be insufficient to meet normal customer demands and are beyond the control of the utility, the utility may elect to activate voluntary conservation using the portion of this plan set forth in Section A of this Rule, after notifying the Director of the Commission's Water Division (WD) of its intent in e-mailed format. The utility's customers shall be notified of the voluntary conservation measures through a bill insert, direct mailing, or electronic notification. (T) (T)

2. Prior or subsequent to the declaration of mandatory reduction by a water wholesaler or government agency, or in the opinion of the utility, mandatory conservation or reduction is needed, the utility may request adding a Schedule No. 14.1 – Water Shortage Contingency Plan with Staged Mandatory Restrictions, Reductions And Drought Surcharges tariff (Schedule No. 14.1), via a Tier 2 advice letter. The utility may request a lost revenue memorandum account at this time. (T) (T)

(D)

3. Schedule No. 14.1 complies with the requirements of the Water Shortage Contingency Plan (WSCP) in Water Code Section 10632 of the Urban Water Management Planning Act. (N)

4. The WSCP requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage) as compared to normal reliability conditions. These water shortage stages have been standardized to allow for a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions. Reduction of available water supply by the indicated percentages or an equivalent regulatory requirement will trigger an appropriate water shortage stage, and GSWC will implement the response actions as specified in Schedule No. 14.1. (N)

5. The utility shall file a Tier 2 advice letter to request activation of a particular stage of Schedule No. 14.1. (T)

   a. If a Declaration of Mandatory Reductions is made by utility, wholesale supplier, or governing agency, or (T)

   b. If the utility is unable to address voluntary conservation levels set by itself, its wholesale supplier, or governing agency, or (T)

   c. If the utility chooses to activate a greater shortage stage (T)

(L)

(L)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan T

GENERAL INFORMATION (Continued)

(L)

6. When Schedule No. 14.1 is activated and the utility determines that water supplies are again sufficient to meet normal demands, and mandatory rationing measures are no longer necessary, the utility shall seek Commission approval via a Tier 1 advice letter to deactivate the particular stage of mandatory reduction that had been authorized.

7. In the event of a water supply shortage requiring a voluntary or mandatory conservation or demand reduction program, the utility shall make available to its customers water conservation kits as required by its version of Rule No. 20. The utility shall notify all customers of the availability of conservation kits via a bill insert, direct mailers, or electronic notification. (T) (T) (T)(L)

A. VOLUNTARY CONSERVATION (T)

1. Other than upon request, water should not be served in eating and drinking establishments, including but not limited to restaurants, hotels, cafes, bars, or other public places where food or drink are served and/or purchased. (L) (T)
2. Hotels/motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option. (N)
3. Potable water used for irrigation outside of newly constructed homes and buildings shall only be delivered by drip or micro spray systems.
4. Commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water use in an amount consistent with the required reduction. (N)

B. NON-ESSENTIAL OR UNAUTHORIZED WATER (T)

1. No customer shall use utility-supplied water for non-essential or unauthorized uses as defined by the State of California or local ordinances. (D)

2. Water waste resulting from a failure to repair or mitigate any leaks, breaks, or other malfunction in a customer's domestic or outdoor water system within forty-eight (48) hours of notification by the utility, unless other specific arrangements are made and agreed to by the utility, may result in termination of service in accordance with Rule No. 11. (T) (T)

3. The application of potable water to outdoor landscapes in a manner that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures. (T) (T) (L) (L)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan (T)

B. NON-ESSENTIAL OR UNAUTHORIZED WATER USE (Continued) (L)

4. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shutoff nozzle or device attached to it that causes it to cease dispensing water immediately when not in use. (T) (T) (T)

5. The use of potable water for washing buildings, structures, sidewalks, walkways, patios, tennis courts, or other hard surfaced, nonporous areas except to protect the health and safety of the public.

(D)

6. Use of potable water for watering streets with trucks or other vehicles, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect public health and safety.

(D) (D) (D) (D)

7. The use of portable water in a fountain or other decorative water feature, except where the water is part of a recirculating system. (T) (T)

(D)

8. The use of potable water for the irrigation of non-functional turf at commercial, industrial and institutional sites. (N)

9. The use of potable water for watering outside plants, lawn, landscape, and turf area during certain hours prohibited by applicable laws or rules, during and up to 48-hours after measurable rainfall (0.1" or more). (T) (T) (T)

10. The use of potable water for irrigation or ornamental turf on public street medians. (N)

(D)

The outdoor irrigation restriction does not apply to trees or edible vegetation watered solely by drip or micro spray systems. (N) (N)

(L)
|
(L)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan T

C. STAGED MANDATORY REDUCTION OF WATER USAGE (L)

1. Prior to implementing mandatory reduction due to declaration by a water wholesaler, government agency or the utility water supply shortage conditions (per Water Code Section 350), a utility may request the addition of a Schedule No. 14.1 – Water Shortage Contingency Plan with Staged Mandatory Restrictions, Reductions And Drought Surcharges tariff, via a Tier 2 advice letter, with full justification. The utility may not activate Schedule No. 14.1 until authorized to do so by the Commission as delegated to WD. (T)
2. A staged Schedule No. 14.1 authorized by the Commission shall remain dormant until triggered by specific conditions detailed in the Schedule No. 14.1 tariff and the utility has requested and received authorization for activating a stage by the Commission in response to a Tier 2 advice letter. (T) (T)
3. Notice of the Tier 2 advice letter and associated public participation hearing, if required, shall be provided to customers through a bill insert, direct mailing, or by electronic notification. (T)
4. The Utility shall comply with all requirements of Sections 350-358 of the California Water Code. (T)
5. The Tier 2 advice letter requesting the addition of a Schedule No. 14.1 shall include but not be limited to: (T) (L)
   a. Proposed Schedule No. 14.1 tariff, which shall include but not be limited to:
      i) Applicability,
      ii) Territory applicable to,
      iii) A detailed description of each Stage of Reduction, (T)
      iv) A detailed description of the Trigger that Activates each Stage of Reduction, (T)
      v) A detailed description of each water use restriction for each stage of reduction, (T)
      vi) Water use violation levels, written warning levels, associated fines, if applicable, and exception procedures,
      vii) Conditions for installation of a flow restrictor,
      viii) Charges for removal of flow restrictors, and
      ix) Special Conditions.
   b. Justification, documentation and calculations in support of the plan. (T)

(L)

(L)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan T

C. STAGED MANDATORY REDUCTION WATER USAGE (Continued)

6. All monies collected by the utility through water use violation fines shall not be accounted for as income but rather booked to a memorandum account to offset authorized expenses incurred or recovery of lost revenue. Lost revenues associated with reduced sales as a result of activation of either Rule No. 14.1 or Schedule No. 14.1 for a non-WRAM utility should be tracked in a separate memorandum account for disposition as directed or authorized from time to time by the Commission. (L)

7. All expenses incurred by utility to activate Rule No. 14.1 and Schedule No. 14.1 that have not been considered in a General Rate Case or other proceeding, shall be recoverable by utility if determined to be reasonable by Commission. These monies shall be accumulated by the utility in a separate memorandum account for disposition as directed or authorized from time to time by the Commission.

8. Number of stages requested by the district/service area may vary, depending on specifics of water shortage event. The utility shall file a Tier 2 advice letter to request activation of a particular stage of Schedule No. 14.1 under the following conditions: (T)(L) (T)

   a. If the utility is unable to achieve desired conservation levels set by itself, wholesale supplier or governing agency through voluntary conservation, or (T)(L) (T)(L)

   b. If a Declaration of Mandatory Reduction is made by the utility, wholesale supplier or governing agency, or (T) (L)

   c. If a government agency with legal jurisdiction over the utility or its service area declares a state of emergency in response to severe drought conditions, earthquake or other catastrophic event that severely reduces the utility's water supply, or (N)

   d. If voluntary conservation levels or mandatory restrictions on certain uses of water, set by the Commission, the utility, wholesale water supplier, or government agency are insufficient, or (N)

   e. If the utility chooses to activate a greater stage with justification and approval by the Commission. (T)(L)

9. The Tier 2 advice letter requesting activation of a Schedule 14.1 shall include but not be limited to:

   a. Justification for activating this particular stage of mandatory reduction, as well as period during which this particular stage of mandatory conservation and reduction measures will be in effect. (T) (T)

   b. When the utility requests activation of a particular Stage, it shall notify its customers as detailed in Section E below.

Rule No. 14.1
Water Conservation And Reduction Plan T

D. ENFORCEMENT OF STAGED MANDATORY CONSERVATION AND REDUCTION (T)

1. The water use restrictions in Section A of this Rule, become mandatory when the Schedule No. 14.1, Stage 2 or higher is triggered, the utility files a Tier 2 advice letter requesting activation of a Stage 2 or higher, and authorization is received from the Commission as delegated to WD. (T) (T)

2. The nonessential or unauthorized water use listed in Section B of this Rule are always mandatory. (D) (N)

3. Each stage of Schedule No. 14.1 has an associated drought surcharge that may be implemented based on local conditions and/or conservation and reduction targets. (T) (T)

4. The utility may after one written warning, install a flow restricting device on the service line of any customer observed or proven by utility personnel to be using water for any nonessential or unauthorized use as defined in Section A or B above when Schedule No. 14.1 Stage 2 or higher has been activated. (T) (T)

   a. A flow restrictor shall not restrict water delivery by greater than 50% of normal domestic flow and shall be capable of providing the premise with a minimum flow of 50 Gallons Per Capita Per Day (GCPD). The restricting device may be removed only by the utility, only after a (7) seven-day period has elapsed, and only upon payment of the appropriate removal charge as setforth in Schedule No. 14.1. (T) (T)

   b. After the removal of the restricting device, if any non-essential or unauthorized use of water continues, the utility may install another flow restricting device without written notice. This device shall remain in place until water supply conditions warrant its removal and until the appropriate charge for removal is paid to the utility.

   c. Customer tampering with flow restricting device may result in discontinuation of water service at the utility's discretion. (T)

   d. If, despite installation of such flow-restricting device pursuant to the provisions of the previous enforcement conditions, any non-essential or unauthorized use of water continues, then the utility may discontinue water service to such customer. In such event, a charge as provided in Rule No. 11, Section C shall be paid to the utility as a condition of restoration of service. (T)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan T

(D)
(D)

E. APPEAL PROCEDURE

1. Any customer who seeks a variance from any of the provisions of this Water Conservation and Reduction Plan shall notify the utility in writing using the appeals form, explaining in detail the reason for such a variation. The utility shall respond to each such request in writing.

2. Any customer not satisfied with the utility's response may contact the Commission. (T)

3. Except as set forth in this Section, no person shall have any right or claim in law or in equity, against the utility because of, or as a result of, any matter or thing done or threatened to be done pursuant to the provisions of the Water Conservation and Reduction Plan. (T)

F. PUBLICITY (L)

1. As stated under Section C.3, when a utility requests the addition of a Schedule No. 14.1, via a Tier 2 advice letter, it shall provide notice of the Tier 2 advice letter and associated public hearing, if applicable, provided to customers through bill inserts, direct mailing, or electronic notification and shall comply with all requirements of Sections 350-358 of the California Water Code (CWC), including but not limited to the following: (T)

   a. In order to be in compliance with both the General Order 96-B and CWC, the utility shall provide notice via both newspaper and bill insert, direct mailing or electronic notification.

   b. Utility shall file one notice for each advice letter filed, that includes both notice of the filing of the Tier 2 advice letter as well as the details of the public hearing (date, time, place, etc.).

   c. The public meeting, if required, shall be held after the utility files the Tier 2 advice letter, and before the Commission authorizes the addition of Schedule No. 14.1 to the tariff except in cases of emergency water shortages approved by WD. (T)

   d. Utility shall consult with WD staff prior to filing advice letter, in order to determine details of public meeting.

(L)

(L)
(L)

Rule No. 14.1
Water Conservation And Reduction Plan T

F. PUBLICITY (Continued)

2. In the event that a Schedule No. 14.1 is activated, and a utility requests activation through the filing of a Tier 2 advice letter, the utility shall notify its customers and provide each customer with a copy of Schedule No. 14.1 by means of bill insert, direct mailing or electronic notification. Notification shall take place prior to imposing any surcharges associated with this plan. If activation of Schedule No. 14.1 occurs one year or more since the public hearing associated with adding Schedule No. 14.1 to its tariffs, then the utility shall conduct a public hearing pursuant to CWC Section 351 prior to activating the mandatory reduction stage.

3. During the period that a stage of Schedule No. 14.1 is activated, the utility shall provide customers with updates regarding its water supply status and the results of customers' conservation efforts. These updates may occur through bill inserts, website updates, or other means of communication. (T) (T) (T)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

A. APPLICABILITY

This Schedule applies to all Golden State Water Company (GSWC) water customers in all Customer Service Areas. This Schedule is effective in times of voluntary conservation or mandatory rationing, as required by Rule No. 14.1. To the extent any provision in this Schedule is inconsistent with Rule No. 14.1, the provisions of this Schedule apply. The drought emergency surcharges listed in this Schedule are in addition to the regular water-use charges under the applicable Schedules as authorized by the California Public Utilities Commission (CPUC) for the respective ratemaking area.

B. TERRITORY

This Schedule is applicable to all GSWC water customers in California.

C. MANDATORY RESTRICTIONS (T) (L) (L) (N) (N)

The State Water Resources Control Board has established the following mandatory restrictions for all water users.

No Customer shall use utility-supplied water for non-essential or unauthorized uses as defined below; customers shall take actions to reduce non-essential and unauthorized water use accordingly as identified below: (L)

a. The application of potable water to outdoor landscapes in a manner that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.
b. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.
c. The use of potable water for washing buildings, structures, sidewalks, walkways, patios, tennis courts, or other hard-surfaced, non-porous areas.
d. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
e. The use of potable water for watering outside plants, lawn, landscape, and turf area during certain hours prohibited by applicable laws or rules, during and up to 48 hours after measurable rainfall (0.1" or more).
f. GSWC will promptly notify customers when aware of leaks within the customer's control; the failure to repair any leaks, breaks, or other malfunction resulting in water waste in a customer's domestic or outdoor water system within forty-eight (48) hours of notification by the utility, unless other, specific arrangements are made with and agreed to by the utility.
g. The serving of water, other than upon request, in eating and drinking establishments, including but not limited to restaurants, hotels, cafes, bars, or other public places where food or drink are served and/or purchased. (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

C. MANDATORY RESTRICTIONS (Continued)

h. Hotels/motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option. (L)
i. The use of potable water for irrigation of ornamental turf on public street medians.
j. The use of potable water for irrigation outside of newly constructed homes and buildings that is not delivered by drip or micro spray systems.
k. Commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water use in an amount consistent with the mandated reduction.
l. Further reduction in or the complete prohibition of any other use of water declared non-essential, unauthorized, prohibited, or unlawful by an authorized government or regulatory agency or official.
m. Use of potable water for watering streets with trucks, or other vehicles, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
n. The outdoor irrigation restriction does not apply to trees or edible vegetation watered solely by drip or micro spray systems.
o. The use of potable water is prohibited for the irrigation of non-functional turf at commercial, industrial and institutional sites. (N) (N)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (T)

A resolution was adopted on August 2, 2021, by the Board of Directors (Board) of American States Water Company, the parent company of GSWC, in response to drought or water supply shortage conditions. As such, GSWC will implement the appropriate Stage of its Water-Use Reduction Plan to either mitigate the water supply shortage in accordance with the Water Shortage Contingency Plan (WSCP) or to achieve identified water usage goals established by an authorized government agency or official, or as directed under court jurisdiction. The required actions outlined for each stage cannot be implemented until GSWC has filed a Tier 2 Advice Letter with the CPUC and CPUC approval has been obtained. (T)

Response actions for each of the six stages of GSWC's WSCP are as follows:

Stage 1 – Stage 1 is a "Water Alert" where voluntary conservation is encouraged. GSWC explains the drought situation to the public and governmental bodies relying on GSWC water. GSWC explains the potential subsequent water shortage stages in order to forecast possible future actions for the customer base. Under Stage 1, GSWC takes the following actions:

- Implement Voluntary Water Conservation Measures authorized under Rule No. 14.1.
- Establish a voluntary demand reduction target for each water system. (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (Continued) (L)

Stage 1 (Continued)

- Inform public of water shortage conditions or demand reduction targets through some or all of the following: distribution of literature, public meetings, website updates, bill inserts, digital media, conservation messages printed in local newspapers, and educational programs in schools.
- Initiate a Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water-use efficiency.
- Identify the year to be used for establishing the customer baseline water use.
- Recommend voluntary customer outdoor irrigation between the hours of 7 PM and 8 AM per the following Schedule (If a city, county, or other public agency adopts restrictions on the number of days or hours of the day that customers may irrigate, GSWC, at its discretion, may adopt and enforce those restrictions): (T) (T) (T)

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Sunday, Wednesday, Friday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday, Thursday, Saturday

Stage 2 – 20% Mandatory Reduction Stage: Stage 2 is a "Moderate Shortage" and will be implemented if the Stage 1 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 2 will include all actions undertaken in Stage 1. GSWC will require mandatory conservation under this stage. Under Stage 2, GSWC takes the following actions:

- All measures implemented in Stage 1 are implemented in Stage 2.
- Outdoor Irrigation is restricted to between the hours of 7 PM and 8 AM per the following schedule (If a city, county, or other public agency adopts restrictions on the number of days or hours of the day that customers may irrigate, GSWC, at its discretion, may adopt and enforce those restrictions): (T) (T) (T)

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Sunday and Wednesday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday and Saturday

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 20%. (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (Continued)

Stage 2 (Continued) (L)

- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T)
- Water Usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to $2.50 per Ccf. (T) (T)
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1, C.3., as noted in Section C. of this Schedule. (T)

Stage 3 – 30% Mandatory Reduction Stage: Stage 3 is a "Severe Shortage" and will be implemented if the Stage 2 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 3 will include all actions undertaken in Stage 2. GSWC will require mandatory conservation under this stage. Under Stage 3, GSWC takes the following actions:

- All measures implemented in Stage 2 are implemented in Stage 3.
- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 30%.
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T)
- Water Usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to $5 per Ccf. (T) (T)
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C. of this Schedule. (T)

Stage 4 - 40% Mandatory Reduction Stage: Stage 4 is a "Critical Shortage" and will be implemented if the Stage 3 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 4 will include all actions undertaken in Stage 3. GSWC will require mandatory conservation under this stage. Under Stage 4, GSWC takes the following actions:

- All measures implemented in Stage 3 are implemented in Stage 4.
- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 40%.
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T) (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (Continued)

Stage 4 (Continued) (L)

- Water Usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to $7.50 per Ccf. (T)
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3., as noted in Section C. of this Schedule. (T)

Stage 5 - 50% Mandatory Reduction Stage: Stage 5 is a "Shortage Crisis" and will be implemented if the Stage 4 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 5 will include all actions undertaken in Stage 4. GSWC will require mandatory conservation under this stage. Under Stage 5, GSWC takes the following actions:

- All measures implemented in Stage 4 are implemented in Stage 5.
- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 50%.
- For residential customer no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T)
- Water Usage in excess of customer baseline to be charged at regular rate plus a drought emergency surcharge of up to $10 per Ccf. (T)
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3., as noted in Section C. of this Schedule. (T)

Stage 6 - 55% Mandatory Reduction Stage: Stage 6 is an "Emergency Shortage" and will be implemented if the Stage 5 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 6 will include all actions undertaken in Stage 5. GSWC will require mandatory conservation under this stage. Under Stage 6, GSWC takes the following actions:

- All measures implemented in Stage 5 are implemented in Stage 6.
- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 55%. (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (Continued)

Stage 6 (Continued) (L)

- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T)

- Water Usage in excess of customer baseline to be charged at regular rate plus a drought emergency surcharge of up to $15 per Ccf. (T)

- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3., as noted in Section C. of this Schedule. (T)

E. DROUGHT SURCHARGES (N)

Excess usage above the baseline drought allocation may result in a Drought Surcharge. The Drought Surcharge is in addition to the base charges allowed under the applicable tariffs authorized by the CPUC.

Customers participating in the Utility's Low Income Customer Assistance Program shall be entitled to a 50% reduction in the Drought Surcharge. (N)

F. FLOW RESTRICTOR CHARGES (T)

The charge for installation and removal of a flow-restricting device shall be:

Connection Size	Charges
5/8″ to 1″	$150
1-1/2″ to 2″	$200
3″ and larger	$300

The flow restrictor will remain installed for a minimum of seven (7) days.

G. EXEMPTION AND APPEALS PROCESS (T)

Any customer who seeks a variance from any of the provisions of this voluntary water conservation plan and/or mandatory conservation plan shall notify the utility in writing, explaining in detail the reason for such a variation. The utility shall respond to each such request in writing.

The appeals form is available online at GSWC website: www.gswater.com/appeal or by calling GSWC's 24-Hour Customer Service Hotline at 1-800-999-4033. (L)

Schedule No. 14.1
Water Shortage Contingency Plan
With Staged Mandatory Restrictions, Reductions And Drought Surcharges

H. SPECIAL CONDITIONS

1. A Tier 2 advice letter will have to be filed with the CPUC to activate any of the Stages of Water Use Reduction and Drought Emergency Surcharges listed in this Schedule.

2. The active Stage of Water Use Reduction and Drought Emergency Surcharges is to remain in effect until a Tier 2 advice letter is filed with the CPUC to activate a different Stage or when Schedule No. 14.1 is deactivated.

3. Water-use violation fines and/or Drought Emergency Surcharges must be separately identified on each bill.

4. All bills are subject to reimbursement fee set forth on Schedule No. UF.

5. All revenue collected by the utility through water use violation fines and/or Drought Emergency Surcharges shall not be accounted for as income, but shall be accumulated in the General Ratemaking Area Balancing Account (GRABA). (T)

(Continued)

SCHEDULE 14.1-CM

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

A. APPLICABILITY

This schedule applies to all water customers in the Claremont Customer Service Area (CM CSA) served under Tariff Schedule R3-1-R, R3-1-NR, R3-CMH-3M, and R3-CM-7ML. This schedule is only effective in times of mandatory rationing, as required by Rule No. 14.1, and only for the period noted in the Special Conditions section below. The drought emergency surcharges listed in this schedule are in addition to the regular water use charges under the current Schedules referenced above as authorized by the Commission.

B. TERRITORY

This schedule is applicable to customers in Claremont Customer Service Area only.

C. MANDATORY WATER USE REDUCTION AND DROUGHT EMERGENCY SURCHARGES

In response to the Governor's Executive Order (B-29-15) the State Water Resources Control Board (Water Board) imposed restrictions to achieve a statewide 25% reduction in potable urban water usage through February 28, 2016. These restrictions will require water consumers to reduce usage as compared to the amount they used in 2013. Golden State Water Company (GSWC) consumers reduced usage in 2014, but will need to achieve additional water conservation in 2015-16 to achieve the statewide goal.

These restrictions are designed to strongly encourage those customers with high per capita usage to achieve proportionally greater reduction than those with low use. The annual mandated reduction for this area is 32%. The following stages will be implemented as needed to achieve the annual mandated reduction. The utility may implement Stage 2 and the associated Drought Emergency Surcharge without first implementing Stage 1 if warranted by the mandated reduction.

(N)

(Continued)

SCHEDULE 14.1-CM

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

Stage 1
Outdoor irrigation is restricted to two days per week:

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Monday and Thursday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday and Friday

Additional restrictions:

All outdoor irrigation must occur between the hours of 9 am or after 5 pm.

Failure to comply with these restrictions may result in the installation of a flow restrictor device along with associated fees for installation and removal.

If conditions warrant, GSWC will change the number of watering days and the specific day of watering after first notifying its customers in accordance with Rule 14.1.

Stage 2
Will be implemented if the Stage 1 restrictions are deemed insufficient to achieve reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official.

In addition to the restrictions identified in Stage 1, the following allocations and drought emergency surcharges are in effect:

1. All customers will have their baseline established using the 2013 usage data for their premise or an area wide average baseline for similar usage if 2013 data does not exist (e.g. new customer accounts).
2. The customer's allocation will be based on the 2013 baseline less 32%.
3. No allocation will be set less than eight (8) Ccf per monthly billing period or sixteen (16) Ccf per bi-monthly billing period.
4. All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $2.50 per ccf.

(N)

(Continued)

SCHEDULE 14.1-CM

STAGED MANDATORY CONSERVATION AND RATIONING

Stage 3
Will be implemented if the Stage 2 allocations and drought emergency surcharges are deemed insufficient to achieve reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. (N)

In addition to the restrictions identified in Stage 1, the following allocations are in effect:

1. All customers will have their baseline established using the 2013 usage data for their premise or an area wide average baseline for similar usage if 2013 data does not exist (e.g. new customer accounts).
2. The customer's allocation will be based on the 2013 baseline less 32%.
3. No allocation will be set less than eight (8) Ccf per monthly billing period or sixteen (16) Ccf per bi-monthly billing period.
4. All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $5.00 per ccf.

Stage 4
Will be implemented if the Stage 3 allocations and drought emergency surcharges are deemed insufficient to achieve reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official.

In addition to the restrictions identified in Stage 1, the following allocations are in effect:

1. All customers will have their baseline established using the 2013 usage data for their premise or an area wide average baseline for similar usage if 2013 data does not exist (e.g. new customer accounts).
2. The customer's allocation will be based on the 2013 baseline less 32%.
3. No allocation will be set less than eight (8) Ccf per monthly billing period or sixteen (16) Ccf per bi-monthly billing period.
4. All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $10.00 per ccf.

(N)

(Continued)

SCHEDULE 14.1-CM

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

D. FLOW RESTRICTOR CHARGES

The charge for installation and removal of a flow-restricting device shall be:

Connection Size	Charges
5/8" to 1"	$150.00
1-1/2" to 2"	$200.00
3" and larger	$300.00

The flow restrictor will remain installed for a minimum of 7 days.

E. EXEMPTION AND APPEALS PROCESS

Any customer who seeks a variance from any of the provisions of this voluntary water conservation and mandatory rationing plan shall notify the utility in writing, explaining in detail the reason for such a variation. The utility shall respond to each such request in writing.

The appeals form is available online at GSWC website: www.gswater.com/appeal, the Claremont CSA office located at 915 W. Foothill Blvd., Suite E, Claremont, CA or by calling 1-800-999-4033.

(N)

(Continued)

SCHEDULE 14.1-CM

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

F. SPECIAL CONDITIONS

1. A Tier 2 advice letter will have to be filed with the Commission to activate any of the Stages of Mandatory Water Use Reduction and Drought Emergency Surcharges listed in this schedule.

2. The active Stage of Mandatory Water Use Reduction and Drought Emergency Surcharges is to remain in effect until a Tier 2 advice letter is filed with the Commission to activate a different Stage or when Schedule 14.1-CM is deactivated.

3. Water use violation fines and/or Drought Emergency Surcharges must be separately identified on each bill.

4. All bills are subject to reimbursement fee set forth on Schedule No. UF.

5. All monies collected by the utility through water use violation fines and/or Drought Emergency Surcharges shall not be accounted for as income, but shall be accumulated in the WRAM and lost revenue portion tracked in the Water Conservation Memorandum Account (WCMA) for non-WRAM tariffs.

6. No Customer shall use utility-supplied water for non-essential or unauthorized uses as defined below:

   a. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flow onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.
   b. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

(N)

(Continued)

SCHEDULE 14.1-CM

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

c. The use of potable water for washing buildings, structures, sidewalks, walkways, patios, tennis courts, or other hard-surfaced, non-porous areas.
d. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
e. The use of potable water for watering outside plants, lawn, landscape, and turf area during certain hours prohibited by applicable laws, during and up to 48 hours after measurable rainfall (0.1" or more).
f. GSWC will promptly notify customers when aware of leaks within the customer's control; the failure to repair any leaks, breaks, or other malfunction resulting in water waste in a customer's domestic or outdoor water system within forty-eight (48) hours of notification by the utility, unless other, specific arrangements are made with and agreed to by the utility.
g. The serving of water, other than upon request, in eating and drinking establishments, including but not limited to restaurants, hotels, cafes, bars, or other public places where food or drink are served and/or purchased.
h. Hotels/motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.
i. The use of potable water for irrigation of ornamental turf on public street medians.
j. The use of potable water for irrigation outside of newly constructed homes and buildings that is not delivered by drip or micro spray systems.
k. Commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, immediately implement water efficiency measures to reduce potable water use in an amount consistent with the mandated reduction.
l. Further Reduction in or the complete prohibition of any other use of water declared non-essential, unauthorized, prohibited, or unlawful by an authorized government or regulatory agency or official.
m. Use of potable water for watering streets with trucks, or other vehicles, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.

7. The outdoor irrigation restriction does not apply to trees or edible vegetation watered solely by drip or microspray systems.

(N)

Rule No. 20

WATER CONSERVATION

A. Purpose
The purpose of this rule is to ensure that water resources available to the utility are put to a reasonable beneficial use and that the benefits of the utility's water water supply and service extend to the largest number of persons.

B. Waste of Water Discouraged
Refer to Rule 11 B. (3).

C. Use of Water-Saving Devices and Practices
Each customer of the utility is encouraged to install water saving devices to reduce the quantity of water used within the residence. Each customer is further encouraged to adopt such other water usage and re-usage practices and procedures as are feasible and reasonable. (T) (T)

D. Water-Saving Kits
The utility will make available, without initial cost to the customer, for use in each residence receiving water service from the utility, a water-saving kit containing the following:

(D)

(1) A device or devices for reducing faucet and shower flow rates; (T)

(2) A dye tablet or tablets for determining if a toilet tank leaks;

(3) Other devices and programs from time to time approved by the utility; (T)

(4) Installation and other instructions and information pertinent to conserving water. (T)

ORDINANCE NO. 2009-10

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CLAREMONT, CALIFORNIA, AMENDING TITLE 8 OF THE CLAREMONT MUNICIPAL CODE ADDING A NEW CHAPTER 8.30 TO ESTABLISH A WATER CONSERVATION AND WATER SUPPLY SHORTAGE PROGRAM AND REGULATIONS

WHEREAS, the City has established policies of sustainability and addressed these issues as part of the City's General Plan; and

WHEREAS, as set forth in the Open Space, Parkland, Conservation, and Air Quality Element of the General Plan, the City encourages sustainable practices including achieving the highest level of water conservation possible; and

WHEREAS, as set forth in the Claremont Sustainable City Plan which was adopted by the City Council in October 2008 and calls for the City to adopt a water conservation ordinance and work to reduce the water consumption in our City to sustainable levels; and

WHEREAS, a reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the southern California region; and

WHEREAS, Southern California is a semi-arid region that is largely dependent upon imported water supplies. A growing population, climate change, environmental concerns, and other factors in other parts of the State and western United States make the region highly susceptible to water supply reliability issues; and

WHEREAS, from time to time drought conditions in the state of California have resulted in reduced supplies of imported water and/or local groundwater; and

WHEREAS, careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs; and

WHEREAS, Article XI, Section 7 of the California Constitution declares that a city or county may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws; and

WHEREAS, Golden State Water Company, the privately-owned retail water provider for the City of Claremont, has requested the City's assistance in enforcing water conservation restrictions even in times when mandatory water conservation measures are not in effect in the City; and

WHEREAS, The City of Claremont will work with partners to improve the water efficiency and drought tolerance of municipal landscaping.

WHEREAS, on May 12, 2009, the City Council studied potential water conservation measures and provided direction to staff as to what regulations were appropriate for Claremont; and

WHEREAS, on June 11, 2009, the Community Services Commission of the City of Claremont held a duly noticed public hearing on this Ordinance, at which time all persons wishing to testify in connection with this Ordinance were heard, and after considering all public comments recommended that the City Council adopt this Ordinance; and

WHEREAS, on July 28, 2009, the City Council of the City of Claremont held a duly noticed public hearing at which time all persons wishing to testify in connection with this Ordinance were heard; and

WHEREAS, after considering all public comments, the City Council determined that this Ordinance is in the best interest of the City; and

WHEREAS, the adoption of this Ordinance is exempt from the California Environmental Quality Act (CEQA) pursuant to Sections 15307 and 15308 of the CEQA Guidelines as these sections exempt actions taken by regulatory agencies for the protection of natural resources and/or the environment; and

WHEREAS, this Ordinance is in the best interest of the City for the following reasons:

(a) The provisions contained in this Ordinance are necessary for the health, safety, and general welfare of the community.

(b) The water conservation regulations in this Ordinance are consistent with the General Plan and further the implementation of the General Plan.

(c) The water conservation regulations in this ordinance promote the following goals and policies of the City.

General Plan Goal 5-15: Achieve the highest level of water conservation possible.

General Plan Policy 5-15.2: Educate the public about the importance of water conservation and avoiding wasteful water habits.

General Plan Policy 5-15.3: Work with the City water provider in exploring water conservation programs, and encourage the water provider to offer incentives for water conservation.

Claremont Sustainable City Plan Goal 1.2: Minimize waste of water resources by advocating and implementing wise use and conservation measures.

(d) This ordinance satisfies Action 1.2.6 of the Claremont Sustainable City Plan, which calls for adoption of a water efficiency ordinance.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF CLAREMONT DOES ORDAIN AS FOLLOWS:

SECTION 1. Title 8 of the Claremont Municipal Code of the City of Claremont, is hereby amended to add a new chapter 8.30 to read as follows:

"Chapter 8.30

Water Conservation

Sections:

8.30.010 Purpose
8.30.020 Definitions
8.30.030 Application
8.30.040 Permanent Water Conservation Requirements
8.30.050 Level 1 Water Supply Shortage
8.30.060 Level 2 Water Supply Shortage
8.30.070 Level 3 Water Supply Shortage – Emergency Condition
8.30.080 Procedures for Determination/Notification of Water Supply Shortage
8.30.090 Hardship Waiver
8.30.100 Penalties and Violations

8.30.010 PURPOSE

The purpose of this Chapter is to establish a water conservation and supply shortage program that will reduce water consumption within the City of Claremont through conservation, assist in effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the City to avoid and minimize the effect and hardship of water shortages to the greatest extent possible.

This chapter establishes water conservation restrictions intended to alter behavior related to water use efficiency at all times and further establishes three levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

8.30.020 DEFINITIONS

The following definitions shall apply to this Chapter:

1. **"Person"** means any natural person or persons, corporation, public or private entity, governmental agency or institution, or any other user of water in the City of Claremont.

2. **"Landscape irrigation system"** means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand or through an automated system.

3. **"Large landscape areas"** means a lawn, landscape, or other vegetated area, or combination thereof, equal to more than one (1) acre of irrigable land.

4. **"Lawn, landscape or other vegetated area"** means any plant material.

5. **"Local Retail Water Agency"** means any agency or privately-owned company that provides water to residents, businesses and other water users in the City of Claremont.

6. **"Single pass cooling systems"** means equipment where water is circulated only once to cool equipment before being disposed.

7. **"Potable water"** means water which is suitable for drinking.

8. **"Recycled water"** means the reclamation and reuse of non-potable water for beneficial use as defined in Title 22 of the California Code of Regulations.

8.30.030. Application

a. The provisions of this chapter apply to any person in the use of any potable water in the City.

b. The provisions of this chapter do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire and other similar emergency services.

c. The provisions of this chapter do not apply to the use of recycled water, with the exception of Section 8.30.040(a).

d. The provisions of this chapter do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops or other vegetation intended for commercial sale.

e. This chapter is intended solely to further the conservation of water. It is not intended to implement any provision of federal, state, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff.

f. Where any provision of the Claremont Municipal Code is in conflict with this chapter, the provision of this Chapter shall take precedence.

8.30.040: Permanent Water Conservation Requirements

The following water conservation requirements are effective at all times. Any person who violates this section shall be subject to the penalties for violation as set forth in Section 8.30.100 and this Code.

a. **Limits on Watering Hours**: Outdoor watering or irrigating of lawn, landscape or any other vegetated area with potable water is prohibited between the hours of 9 a.m. and 5 p.m. Pacific Standard Time (PST) on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour.

b. **Limit on Watering Duration**: Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.

c. **No Excessive Water Flow or Runoff:** Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.

d. **No Washing Down Hard or Paved Surfaces:** Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys is prohibited, except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

e. **Obligation to Fix Leaks, Breaks or Malfunctions:** Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more

than five (5) business days of the property owner receiving notice from Local Retail Water Agency or the City of Claremont, is prohibited.

f. **Re-circulating Water Required for Water Fountains and Decorative Water Features**: Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.

g. **Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This subsection does not apply to any commercial car washing facility.

h. **Drinking Water Served Upon Request Only:** Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

i. **Commercial Lodging Establishments Must Provide Guests Option to Decline Daily Linen Services**: Hotels, motels and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language.

j. **No Installation of Single Pass Cooling Systems**: Installation of single pass cooling systems is prohibited in buildings requesting new water service.

k. **No Installation of Non-recirculating Commercial Car Wash and Laundry Systems:** Installation of non-recirculating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.

l. **Restaurants Required to Use Water Conserving Dish Wash Spray Valves**: Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

8.30.050: Level 1 Water Supply Shortage

a. Upon the declaration by the city manager of a Level 1 Water Supply Shortage condition, the City will implement the mandatory Level 1 conservation measures identified in this section. Following the City Manager's declaration, he or she shall agendize before the City Council an item for the council to affirm the declaration.

Generally, a Level 1 Water Supply Shortage is warranted when a reduction in consumer demand of up to 10 percent is needed to respond to existing water conditions. Conditions to be considered by the city manager and City Council in declaring a water supply shortage include, but are not limited to: time of year, local rainfall totals, regional/subregional water district's Water Supply Allocation Plans, groundwater use programs, State Water Project allocations or anticipated allocations, local or regional water system emergencies, or natural disasters that cause damage to water supplies or water distribution system.

b. **Additional Water Conservation Measures:** In addition to the prohibited uses of water identified in Section 8.30.40, the following water conservation requirements apply during a declared Level 1 Water Supply Shortage. Any person in violation of this Subsection shall be subject to the penalties for violation as set forth in Section 8.30.100 and this Code.

1. **Limits on Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to three (3) days per week on a schedule established and posted by the City of Claremont. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the City of Claremont. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification of the property owner by the City of Claremont or a Local Retail Water Agency unless other arrangements are made with the City or Local Retail Water Agency.

8.30.060. Level 2 Water Supply Shortage

a. Upon the declaration by the city manager of a Level 2 Water Supply Shortage condition, the City will implement the mandatory Level 2 conservation measures identified in this section. Following the city manager's declaration, he or she shall agendize before the City Council an item for the council to affirm the declaration. Generally, a Level 2 Water Supply Shortage is warranted when a reduction in consumer demand of 11 to 30 percent is needed to respond to existing water conditions.

b. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Section 8.30.040 and 8.30.050, the following additional water conservation requirements apply during a declared Level 2 Water Supply Shortage.

1. **Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two (2) days per week on a schedule established and posted by the City of Claremont. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the City of Claremont. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification of the property owner by the City of Claremont or the Local Retail Water Agency unless other arrangements are made with the either the City or Local Retail Water Agency.

3. **Limits on Filling Ornamental Lakes or Ponds**: Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this ordinance.

4. **Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

5. **Limits on Filling Residential Swimming Pools & Spas:** Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

8.30.070. Level 3 Water Supply Shortage Emergency

a. A Level 3 Water Supply Shortage condition is also referred to as an "Emergency" condition. A Level 3 condition exists when the city manager declares a water shortage emergency and notifies its residents and businesses that a significant reduction in consumer demand is necessary to maintain sufficient water supplies for public health and safety. Upon the declaration of a Level 3 Water Supply Shortage condition, the City will implement the mandatory Level 3 conservation measures identified in this section. Following the city manager's declaration, he or she shall agendize before the City Council an item for the council to affirm the declaration. Generally, a Level 3 Water Supply Emergency is warranted when a reduction in consumer demand of more than 30 percent is needed to respond to existing water conditions.

b. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Section 8.30.040, 8.30.050 and 8.30.060, the following water conservation requirements apply during a declared Level 3 Water Supply Shortage Emergency.

1. **No Watering or Irrigating:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the following categories of use, unless the City has determined that recycled water is available and may be applied to the use:

   i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self–closing water shut-off nozzle or device;

   ii. Maintenance of existing landscape necessary for fire protection;

   iii. Maintenance of existing landscape for soil erosion control;

   iv. Maintenance of plant materials identified to be rare or essential to the well-being of protected species;

   v. Maintenance of landscape within active public parks and playing fields, day care centers, golf course greens, and school grounds, provided that such irrigation does not exceed two (2) days per week according to the schedule established in Section 8.30.060 (b)(1) and time restrictions in Section 8.30.040 (a) and (b);

   vi. Actively irrigated environmental mitigation projects.

2. **Obligation to Fix Leaks, Breaks or Malfunctions**: All leaks, breaks, or other malfunctions in any plumbing or water distribution system must be repaired within twenty four (24) hours of notification of the property owner

by the City or Local Retail Water Agency unless other arrangements are made with the City or Local Retail Water Agency.

8.30.080. Procedures for Determination/Notification of Water Supply Shortage

a. **Declaration and Notification of Water Supply Shortage:** The existence of Level 1, Level 2 or Level 3 Water Supply Shortage conditions may be declared by the city manager and affirmed by resolution of the City Council adopted at a regular or special public meeting held in accordance with state law. The mandatory conservation requirements applicable to Level 1, Level 2 or Level 3 conditions will take effect ten (10) days after the date the shortage level is declared. Within five (5) days following the declaration of the shortage level, the City Council must publish a copy of the resolution in a newspaper used for publication of official notices.

b. **Declaration and Notification that a Water Supply Shortage Has Ended:** The City Council may declare an end to a water supply shortage situation upon recommendation from the city manager, or designee, by approval of a resolution at a regular or special public meeting of the City Council.

8.30.090. Hardship Waiver

a. **Undue and Disproportionate Hardship:** If, due to unique circumstances, a specific requirement of this chapter would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water users, then the person may apply for a waiver to the requirements as provided in this section.

b. **Written Finding:** The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property.

1. **Application**: Application for a waiver must be on a form prescribed by the City and accompanied by a non-refundable processing fee in an amount set by City Council resolution.

2. **Supporting Documentation**: The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

3. **Required Findings for Waiver:** An application for a waiver will be denied unless the Community Development Director finds, based on the information provided in the application, supporting documents, or such

additional information as may be requested, and on water use information for the property as shown by the records of the Local Retail Water Agency or its Agent, all of the following:

i. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;

ii. That because of special circumstances applicable to the property or its use, the strict application of this chapter would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;

iii. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the City Council to effectuate the purpose of this chapter and will not be detrimental to the public interest; and

iv. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

4. **Approval Authority**: The city manager, or his designee, must act upon any completed application no later than ten (10) days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the city manager, or his designee, will be final.

8.30.100. Penalties and Violations

a. **Misdemeanor:** Any violation of this chapter may be prosecuted as a misdemeanor punishable by imprisonment in the county jail for not more than thirty (30) days, or by a fine not exceeding one thousand dollars ($1,000), or by both.

b. **Penalties:** Penalties for failure to comply with any provisions of the ordinance are as follows:

1. **First Violation:** The City may issue a written warning and deliver a copy of this ordinance by mail to a violator.

2. **Second Violation:** A second violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed one hundred dollars ($100).

3. **Third Violation:** A third violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed two hundred and fifty dollars ($250).

4. **Fourth and Subsequent Violations:** A fourth and any subsequent violation is punishable by a fine not to exceed five hundred dollars ($500).

c. **Separate Offenses**: Each day that a violation of this chapter occurs is a separate offense."

SECTION 2. Severability: If any section, subsection, sentence, clause or phrase in this chapter is for any reason held invalid, the validity of the remainder of the chapter will not be affected. The City Council hereby declares it would have passed this chapter and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases is declared invalid.

SECTION 3. The mayor shall sign this ordinance and the city clerk shall attest and certify to the passage and adoption of it, and within fifteen (15) days, publish in the Claremont Courier, a semi-weekly newspaper of general circulation, printed, published, and circulated in the City of Claremont and thirty (30) days thereafter it shall take effect and be in force.

PASSED, APPROVED, AND ADOPTED this 28th day of July, 2009.

Linda P. Elder
Mayor Pro Tem, City of Claremont

ATTEST:

Lynne E. Fryman
City Clerk, City of Claremont

APPROVED AS TO FORM:

Sonia R. Carvalho
City Attorney, City of Claremont

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss.
CITY OF CLAREMONT)

I, Lynne Fryman, City Clerk of the City of Claremont, County of Los Angeles, State of California, hereby certify that the foregoing Ordinance No. 2009-10 was introduced at a regular meeting of said council held on the 14th day of July, 2009, that it was regularly passed and adopted by said city council, signed by the mayor pro tem, and attested by the city clerk of said city, all at a regular meeting of said council held on the 28th day of July, 2009, and that the same was passed and adopted by the following vote:

AYES:	COUNCILMEMBERS:	PEDROZA, YAO, ELDERKIN, SCHROEDER
NOES:	COUNCILMEMBERS:	MAYOR CALAYCAY
ABSTAINED:	COUNCILMEMBERS:	NONE
ABSENT:	COUNCILMEMBERS:	NONE

Executed this 28th day of July, 2009 at Claremont, California.

Lynne E. Fryman
City Clerk of the City of Claremont

RECORDING REQUESTED BY AND MAIL TO:

Claremont Courier
1420 N. Claremont Blvd.
Suite 205-B
Claremont, CA 91711
909-621-4761

This space is for the County Clerk's Filing Stamp

PROOF OF PUBLICATION
(2015.5 C.C.P)

STATE OF CALIFORNIA,
County of Los Angeles,

MAIL TO: _____

I am a citizen of the United States and a resident of the County aforesaid: I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the

CLAREMONT COURIER

A newspaper of general circulation, printed and published **semi-weekly** in the City of **Claremont**, County of Los Angeles; and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of Los Angeles, State of California, under the date of 9/17, 1908, Case Number C134; that the notice, of which the annexed is a printed copy (set in type not smaller than nonparell), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

7/22

all in the year 2009

Proof of Publication of

on BACK

I certify (or declare) under penalty of perjury that the foregoing is true and correct.
Dated at Claremont, California,
this 22 day of July, 2009.

Sandy Adams
Signature

SUMMARY OF ORDINANCE INTRODUCED AT THE REGULAR CLAREMONT CITY COUNCIL MEETING OF JULY 14, 2009

(Full text of this ordinance is on file in the office of the City Clerk)

SUMMARY OF ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CLAREMONT, CALIFORNIA, ADDING A NEW CHAPTER TO TITLE 8 OF THE CLAREMONT MUNICIPAL CODE TO ESTABLISH A WATER CONSERVATION AND WATER SUPPLY SHORTAGE PROGRAM AND REGULATIONS

The purpose of the ordinance is to enable the City to enforce sensible water use habits in situations where water is clearly being wasted and to have a means for enforcing more stringent measures in times of severe water supply reductions.

The ordinance creates the following permanent limitations regarding water use in the City. The following limitations would be in effect at all times:

- No watering between the hours of 9 a.m. and 5 p.m.
- Watering duration is limited to (15) minutes watering per day per station
- No excessive water flow or runoff from outdoor watering
- No washing down hard or paved surfaces with water Obligation to fix leaks, breaks or malfunctions (within 5 business days of notice)
- Re-circulating water required for water fountains and decorative water features
- Wash vehicles only with a bucket or hose with shut off nozzle
- Restaurants only serve water upon request
- Hotels must provide guests option to decline daily linen laundering
- No installation of single-pass cooling systems
- No installation of non-recirculating commercial car wash and laundry systems
- Restaurants required to use water conserving dish wash spray valves

In addition to these permanent limitations, the ordinance includes three levels of increasingly stringent restrictions that could be implemented during times of serious drought or water emergencies. These additional restrictions are summarized in the table below:

Level 1 – Alert
(Up to 10% Reduction Needed)
All permanent restrictions plus:
Watering limited to 3 days per week
Fix leaks within 72 hours

Level 2 – Critical
(11% to 30% Reduction Needed)
All permanent restrictions plus:
Watering limited to 2 days per week
Fix leaks within 48 hours
No re-filling of ornamental lakes or ponds
Commercial car washes must be equipped with recirculating systems
Limited filling of residential pools and spas

Level 3 – Emergency
(Above 30 % Reduction Needed)
All permanent restrictions plus all Level 2 restrictions plus:
No watering or irrigating with certain exceptions
Fix leaks within 24 hours

The ordinance includes provisions for the granting of hardship waivers when required findings can be made. It also includes penalties that may be assessed for violations of the above described water use limits and restrictions.

Copies of the proposed ordinance are available for review at City Hall, 207 Harvard Avenue; the Claremont Public Library, 208 Harvard Avenue; and on the City of Claremont website, www.ci.claremont.ca.us. For more information, contact Senior Planner Christopher Veirs at (909) 399-5486.

Publish: July 22, 2009'

ORDINANCE NO. 2010-02

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CLAREMONT, CALIFORNIA, AMENDING TITLE 16 OF THE CLAREMONT MUNICIPAL CODE BY ADDING CHAPTER 16.131 REGARDING THE ADOPTION OF A WATER EFFICIENT LANDSCAPE ORDINANCE

WHEREAS, the City has established sustainability goals created policies to address these goals as part of the City's General Plan; and

WHEREAS, as set forth in the Open Space, Parkland, Conservation, and Air Quality Element of the General Plan, the City encourages sustainable practices, including achieving the highest level of water efficiency and conservation possible; and

WHEREAS, as the Claremont Sustainable City Plan, which was adopted by the City Council in October 2008, calls on the City to adopt a water conservation ordinance and work to reduce the water consumption within the City; and

WHEREAS, a reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the southern California region; and

WHEREAS, it is estimated by the watermaster for the Claremont area that 70 percent of water consumed in Claremont is utilized outdoors for landscaping, pools and water features; and

WHEREAS, Southern California is a semi-arid region where factors including a growing population, climate change, environmental concerns, and an expected long-term decline in imported water supply necessitate a more appropriate form of outdoor landscaping and irrigation; and

WHEREAS, careful water management that includes water efficient landscaping and irrigation practices, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs; and

WHEREAS, Article XI, Section 7 of the California Constitution declares that a city or county may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws; and

WHEREAS, on December 15, 2009, the Planning Commission of the City of Claremont held a duly noticed public hearing on this ordinance, at which time all persons wishing to testify in connection with this ordinance were heard, and after considering all public comments recommended that the City Council adopt this ordinance by a 5-2 vote; and

WHEREAS, on January 12, 2010, the City Council of the City of Claremont held a duly noticed public hearing at which time all persons wishing to testify in connection with this ordinance were heard.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF CLAREMONT DOES ORDAIN AS FOLLOWS:

Section 1. After considering all public comments, the City Council determined that this ordinance is in the best interest of the City based on the following reasons:

(a) The provisions contained in this ordinance are necessary for the health, safety, and general welfare of the community.

(b) The water efficient landscape regulations in this ordinance are consistent with the General Plan and further the implementation of the General Plan.

(c) The water efficient landscape regulations in this ordinance promote the following goals and policies of the City.

General Plan Goal 5-15: Achieve the highest level of water conservation possible.

General Plan Policy 5-15.2: Educate the public about the importance of water conservation and avoiding wasteful water habits.

Claremont Sustainable City Plan Goal 1.2: Minimize waste of water resources by advocating and implementing wise use and conservation measures.

(d) This ordinance satisfies Action 1.2.6 of the Claremont Sustainable City Plan, which calls for adoption of a water efficiency ordinance.

Section 2. The City Council hereby determines that this ordinance is exempt from review under the California Environmental Quality Act ("CEQA") (California Public Resources Code Section 21000 et seq.), pursuant to State CEQA Guideline Regulation 15307 (14 Cal. Code Regs., § 15307), which exempts actions taken by regulatory agencies, as authorized by State law, to assure the maintenance, restoration, enhancement, or protection of a natural resource where the regulatory process involves procedures for protection of the environment. The adoption of this ordinance is required by State Law (AB1881) and will result in the enhancement and protection of water resources in the City. The ordinance will not result in negative impacts to the environment. It is therefore exempt from the provisions of CEQA.

The City Council hereby directs the City Manager or designee to prepare and file a Notice of Exemption as soon as possible following adoption of this ordinance.

Section 3. Based on the findings contained in Sections 1 and 2 above, Title 16, of the Claremont Municipal Code is hereby amended by adding Chapter 16.131 to read as follows:

"Chapter 16.131

Water Efficient Landscape Requirements

Sections:

16.131.010 Purpose
16.131.020 Applicability
16.131.030 Implementation Procedures
16.131.040 Landscape Water Use Standards
16.131.050 Delegation
16.131.060 Definitions

16.131.010 Purpose

A. The State Legislature has found that:

(1) the waters of the State are of limited supply and are subject to ever increasing demands;

(2) the continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;

(3) it is the policy of the State to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;

(4) landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development;

(5) landscape design, installation, maintenance, and management can and should be water efficient; and

(6) Article X, Section 2 of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served, and the right does not and shall not extend to waste or unreasonable method of use of water.

B. The City hereby finds that:

(1) The City of Claremont has an established a water conservation ordinance that prohibits wasteful uses of water throughout the City by all water users;

(2) The wholesale water purveyor and regional water import agency have developed an allocation-based and tiered water rate structure

that requires the local retail water provider to document water use for all water meters in the City;

(3) Incentive-based water use efficiency programs have been actively implemented within Claremont for many years;

(4) current local design practices in new landscapes typically achieve the State Model Water Efficient Landscape Ordinance water use goals;

(5) all water services within the City are metered;

(6) landscape plan submittal and review has been a long standing practice in Claremont;

(7) the average rainfall in Claremont is approximately 17.3 inches per year and the annual reference evapotranspiration rate (Annual ETo) is 51.3; and

(8) the local water purveyor has implemented a tiered-rate billing structure and enforcement of water waste prohibitions for all existing properties throughout its service area, which includes the City of Claremont in its entirety.

C. Consistent with these findings, the purpose of the City's Water Efficient Landscape Ordinance is to establish an alternative local ordinance that is acceptable under AB 1881 as being at least as effective as the State Model Water Efficient Landscape Ordinance in the context of conditions in the City in order to:

(1) promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;

(2) establish a set of procedures for planning, designing, installing, and maintaining and managing water efficient landscapes in *new construction* and rehabilitated projects;

(3) establish provisions for water management practices and water waste prevention for existing landscapes; and

(4) use water efficiently without waste by setting a *Maximum Applied Water Allowance* as an upper limit for water use and reduce water use to the lowest practical amount.

[Note: Authority cited: Section 65593, Government Code. Reference: Sections 65591, 65593, 65596, Government Code.]

16.131.020 Applicability

A. **New Landscape Installations or Rehabilitation Projects:** This chapter shall apply to the following *landscape projects*:

(1) new landscape installations or landscape rehabilitation projects by public agencies or private non-residential developers, except for cemeteries, with a *landscaped area*, including pools or other *water features* but excluding hardscape, equal to or greater than 2,500 square feet, and which are otherwise subject to a discretionary approval of a landscape plan, or which otherwise require a ministerial *permit* for a landscape or *water feature*;

(2) new landscape installations or landscape rehabilitation projects by developers or property managers of single-family and multi-family residential projects or complexes with a landscaped area, including pools or other *water features* but excluding *hardscape*, equal to or greater than 2,500 square feet, and which are otherwise subject to a discretionary approval of a landscape plan, or which otherwise require a ministerial *permit* for a landscape or *water feature*;

(3) new landscape installation projects by individual homeowners on single-family or multi-family residential lots with a total project landscaped area, including pools or other *water features* but excluding *hardscape*, equal to or greater than 5,000 square feet, and which are otherwise subject to a discretionary approval of a landscape plan, or which otherwise require a ministerial *permit* for a landscape or *water feature*;

(4) recognizing the special landscape management needs of cemeteries, prior to new landscape installations or landscape rehabilitation projects at cemeteries the following shall be prepared: a water efficient landscape worksheet; landscape and irrigation maintenance schedule; and irrigation audit, survey and water use analysis as required in the *guidelines.*

B. **Existing Landscapes:** Section 16.131.040 (B), of this Chapter shall apply to:

(1) all *landscaped areas* over 1 acre in size, whether installed prior to or after January 1, 2010; and

(2) all *landscaped areas* installed after January 1, 2010 to which Section 16.131.020 (a) is applicable.

C. This chapter shall not apply to:

(1) registered local, state, or federal historical sites;

(2) *ecological restoration projects* that do not require a permanent irrigation system;

(3) *mined-land reclamation projects* that do not require a permanent irrigation system; or

(4) plant collections, as part of botanical gardens and arboretums that are open to the public.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

16.131.030 Implementation Procedures

A. Prior to installation, a *Landscape Documentation Package* shall be submitted to the City for review and approval of all *landscape projects* subject to the provisions of this Chapter. Any *Landscape Documentation Package* submitted to the City shall comply with the provisions of the *guidelines*.

B. The *Landscape Documentation Package* shall include a certification by a professional appropriately licensed in the State of California stating that the landscape design and water use calculations have been prepared by or under the supervision of the licensed professional and are certified to be in compliance with the provisions of this chapter and the *guidelines*.

(1) Landscape and irrigation plans shall be submitted to the City for review and approval with appropriate water use calculations.

(2) Water use calculations shall be consistent with calculations contained in the *guidelines* and shall be provided to the *local water purveyor,* as appropriate, under procedures determined by the City.

(3) Verification of compliance of the landscape installation with the approved plans shall be obtained through a *Certification of Completion* in conjunction with a Certificate of Use and Occupancy or Permit Final process, as provided in the *guidelines*.

[Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.]

16.131.040 Landscape Water Use Standards

A. **New and Rehabilitated Landscapes:** For landscape installation or rehabilitation projects subject to the applicability requirements of Section 16.131.020 (a), the Estimated Applied Water Use allowed for the landscaped area shall not exceed the Maximum Applied Water Allowance (MAWA) calculated using an evapotranspiration adjustment factor (ETAF) of 0.7, except for *special landscaped areas* where the MAWA is calculated using an ETAF of 1.0; or the design of the landscaped area shall otherwise be shown to be equivalently water-efficient in a manner acceptable to the City; as provided in the guidelines.

B. **Existing Landscapes:** Irrigation of all *landscaped areas* shall be conducted in a manner conforming to the rules and requirements, and shall be subject to penalties and incentives for water conservation and water waste prevention as determined and implemented by the *local water purveyor* or as mutually agreed by *local water purveyor* and the City.

16.131.050 Delegation

The City may delegate to, or enter into a contract with, a *local agency* to implement, administer, and/or enforce any of the provisions of this chapter.

16.131.060 Definitions

The following definitions are applicable to this chapter:

"***Applied water***" means the portion of water supplied by the irrigation system to the landscape.

"***Budget-based tiered-rate structure***" means tiered or block rates for irrigation accounts charged by the retail water agency in which the block definition for each customer is derived from lot size or irrigated area and the evapotranspiration requirements of landscaping.

"***Ecological restoration project***" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

"***Estimated Applied Water Use***" means the average annual total amount of water estimated to be necessary to keep plants in a healthy state, calculated as provided in the *guidelines*. It is based on the *reference evapotranspiration* rate, the size of the landscape area, *plant water use factors*, and the relative *irrigation efficiency* of the irrigation system.

"***Evapotranspiration***" or "***ETo***" – see "Reference Evapotranspiration"

"***Evapotranspiration adjustment factor***" or "***ETAF***" is equal to the *plant factor* divided by the *irrigation efficiency factor* for a *landscape project*, as described in the *guidelines*.

The *ETAF* is calculated in the context of local *reference evapotranspiration*, using site-specific *plant factors* and *irrigation efficiency factors* that influence the amount of water that needs to be applied to the specific *landscaped area*.

A combined plant mix with a site-wide average *plant factor* of 0.5 (indicating a moderate water need) and average *irrigation efficiency* of 0.71 produces an *ET adjustment factor* of (0.7) = (0.5/0.71), which is the standard of water use efficiency generally required by this chapter and the *guidelines,* except that the *ETAF* for a *special landscape area* shall not exceed 1.0.

"***Guidelines***" refers to the Guidelines for Implementation of the Water Efficient Landscape Ordinance, as adopted by resolution of the City Council, which describes procedures, calculations, and requirements for *landscape projects* subject to this chapter.

"***Hardscapes***" means any durable material or feature (*pervious* and *non-pervious*) installed in or around a *landscaped area*, such as pavements or walls. Pools and other *water features* are considered part of the *landscaped area* and not considered *hardscapes* for purposes of this chapter.

*"**Homeowner installed landscape**"* means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This definition excludes speculative homes, which are not owner-occupied dwellings and which are subject under this ordinance to the requirements applicable to developer-installed residential landscape projects.

"***Irrigation efficiency***" means the measurement of the amount of water beneficially used divided by the amount of water applied. *Irrigation efficiency* is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average *irrigation efficiency* for purposes of this Chapter is 0.71. Greater *irrigation efficiency* can be expected from well designed and maintained systems.

"***Landscaped area***" means all the planting areas, *turf* areas, and *water features* in a landscape design plan subject to the *Maximum Applied Water Allowance* and *Estimated Applied Water Use* calculations. The *landscaped area* does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other *pervious* or *non-pervious hardscapes*, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

"***Landscape contractor***" means a person licensed by the State of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

"***Landscape Documentation Package***" means the documents required to be provided to the City for review and approval of landscape design projects, as described in the *guidelines*.

"***Landscape project***" means total area of landscape in a project, as provided in the definition of "*landscaped area,*" meeting the applicability requirements under Section 16.131.020 of this chapter.

"***Local agency***" means a city or county, including a charter city or charter county, that is authorized by the City to implement, administer, and/or enforce any of the provisions of the Water Efficient Landscape Ordinance on behalf of the City. The *local agency* may be responsible for the enforcement or delegation of enforcement of this Water Efficient Landscape Ordinance including, but not limited to, design review, plan check, issuance of *permits,* and inspection of a *landscape project.*

"***Local water purveyor***" means any entity, including a public agency, city, county, or private water company that provides retail water service.

"***Maximum Applied Water Allowance***" or "***MAWA***" means the upper limit of annual *applied water* for the *established landscaped area* as specified in Section 2.2 of the *guidelines*. It is based upon the area's *reference evapotranspiration*, the *ET Adjustment Factor*, and the size of the *landscaped area*. The *Estimated Applied Water Use* shall not exceed the *Maximum Applied Water Allowance*.

"***Mined-land reclamation projects***" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

"***New construction***" means, for the purposes of this Water Efficient Landscape Ordinance, a new building with a landscape or other new landscape such as a park, playground, or greenbelt without an associated building.

"***Non-pervious***" means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

"***Pervious***" means any surface or material that allows the passage of water through the material and into the underlying soil.

"***Permit***" means an authorizing document issued by local agencies for *new construction* or *rehabilitated landscape*.

"***Plant factor***" or "***plant water use factor***" is a factor, when multiplied by *ETo*, that estimates the amount of water needed by plants. For purposes of this Water Efficient Landscape Ordinance, the *plant factor* range for low water use plants is 0 to 0.3; the *plant factor* range for moderate water use plants is 0.4 to 0.6; and the *plant factor* range for high water use plants is 0.7 to 1.0. *Plant factors* cited in this Water Efficient Landscape Ordinance are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species."

"***Recycled water***" or "***reclaimed water***" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and *water features.* This water is not intended for human consumption.

"***Reference evapotranspiration***" or "*ETo*" means a standard measurement of environmental parameters which affect the water use of plants. *ETo* is given expressed in inches per day, month, or year as represented in Appendix A of the *Guidelines*, and is an estimate of the evapotranspiration of a large field of four-to seven-inch tall, cool-season grass that is well watered. *Reference evapotranspiration* is used as the basis of determining the *Maximum Applied Water Allowances*.

"***Rehabilitated landscape***" means any re-landscaping project that meets the applicability criteria of Section 16.131.020(a), where the modified landscape area is greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are planned to occur within one year.

"***Smart automatic irrigation controller***" means an automatic timing device used to remotely control *valves* that operate an irrigation system and which schedules irrigation events using either evapotranspiration (weather-based) or soil moisture data.

"***Special landscape area***" means an area of the landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with *recycled water*, *water features* using *recycled water*, and areas dedicated to active play such as parks, sports fields, golf courses, and where *turf* provides a playing surface.

"***Turf***" means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

"***Valve***" means a device used to control the flow of water in an irrigation system.

"***Water feature***" means a design element where open water performs an aesthetic or recreational function. *Water features* include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of *water features* is included in the high water use *hydrozone* of the *landscaped area*. Constructed wetlands used for on-site wastewater treatment, habitat protection or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not *water features* and, therefore, are not subject to the water budget calculation.

[Note: Authority Cited: Section 65595, Government Code. Reference: Sections 65592, 65596, Government Code.]

Section 4. Severability: The provisions of this ordinance are severable, and the invalidity of any section, paragraph, phrase, clause, or part of this ordinance shall not affect the validity or effectiveness of the remainder of this ordinance.

Section 5. Certification: The Mayor shall sign this ordinance and the City Clerk shall attest and certify to the passage and adoption of it, and within fifteen (15) days, publish in the Claremont Courier, a semi-weekly newspaper of general circulation, printed, published, and circulated in the City of Claremont and thirty (30) days thereafter it shall take effect and be in force.

PASSED, APPROVED, AND ADOPTED this 9th day of March, 2010.

Linda P. Elder
Mayor, City of Claremont

ATTEST:

Lynne E. Thomas
City Clerk, City of Claremont

APPROVED AS TO FORM:

Sonia R. Carvalho
City Attorney, City of Claremont

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss.
CITY OF CLAREMONT)

I, Lynne Fryman, City Clerk of the City of Claremont, County of Los Angeles, State of California, hereby certify that the foregoing Ordinance No. 2010-02 was introduced at a regular meeting of said council held on the 23rd day of February, 2010, that it was regularly passed and adopted by said city council, signed by the mayor, and attested by the city clerk of said city, all at a regular meeting of said council held on the 9th day of March, 2010, and that the same was passed and adopted by the following vote:

AYES:	COUNCILMEMBERS:	CALAYCAY, ELDERKIN, PEDROZA, SCHROEDER, YAO
NOES:	COUNCILMEMBERS:	NONE
ABSTAINED:	COUNCILMEMBERS:	NONE
ABSENT:	COUNCILMEMBERS:	NONE

Lynne E. Fryman
City Clerk of the City of Claremont

RECORDING REQUESTED BY AND MAIL TO:

Claremont Courier
1420 N. Claremont Blvd.
Suite 205-B
Claremont, CA 91711
909-621-4761

This space is for the County Clerk's Filing Stamp

PROOF OF PUBLICATION
(2015.5 C.C.P)

STATE OF CALIFORNIA.
County of Los Angeles,

I am a citizen of the United States and a resident of the County aforesaid: I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the

CLAREMONT COURIER

A newspaper of general circulation, printed and published **semi-weekly** in the City of **Claremont**, County of Los Angeles; and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of Los Angeles, State of California, under the date of 9/17, 1908, Case Number C134; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

3/13

all in the year 2010

I certify (or declare) under penalty of perjury that the foregoing is true and correct.
Dated at Claremont, California.
this 13 day of March, 2010

Sandy [illegible]
Signature

MAIL TO: _____

Proof of Publication of

ON BACK

CITY WATER EFFICIENT LANDSCAPE ORDINANCE

SUMMARY OF ORDINANCE NO. 2010-02 INTRODUCED AT THE REGULAR CITY COUNCIL MEETING OF FEBRUARY 23, 2010 AND ADOPTED AT REGULAR CITY COUNCIL MEETING OF MARCH 9, 2010

(Full text of this ordinance is on file in the office of the City Clerk)

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF CLAREMONT, CALIFORNIA, AMENDING TITLE 16 OF THE CLAREMONT MUNICIPAL CODE BY ADDING CHAPTER 16.131 REGARDING THE ADOPTION OF A WATER EFFICIENT LANDSCAPE ORDINANCE.

THE FOLLOWING IS A SUMMARY OF THE ABOVE TITLED ORDINANCE:

The provisions of the proposed ordinance apply to the following projects:

New homeowner installed or hired landscapes greater than or equal to 5,000 square feet.

New and rehabilitated public agency, private development, and developer installed single and multi-family landscape projects greater than or equal to 2,500 square feet.

Guidelines for implementing the proposed ordinance include formulas for calculating the maximum allowable water that can be used for each new landscape. Developers and homeowners installing landscaping for which this ordinance is applicable will be required to:

Submit a landscape documentation package that demonstrates compliance with the maximum allowable water use for the landscape.

Design the landscape to be water efficient by organizing plants into hydrozones and utilizing water-conserving plants and turf.

Install the landscaping in accordance with the plan.

Have a licensed landscape professional certify that the landscaping was installed in accordance with the plan and that the irrigation system is operating as designed.

Maintain and operate the landscape in a water efficient manner.

Claremont's proposed water efficient landscape ordinance is available for review at City Hall, 207 Harvard Avenue; the Claremont Public Library, 208 Harvard Avenue; and on the City of Claremont website, www.ci.claremont.ca.us. Please submit any written comments to Senior Planner Christopher Veirs, P.O. Box 880, Claremont, CA 91711 or at cveirs@ci.claremont.ca.us. For more information, contact Mr. Veirs at (909) 399-5486.

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss.
CITY OF CLAREMONT)

I, Lynne E. City Clerk of the City of Claremont, County of Los Angeles, State of California, hereby certify that the foregoing Ordinance No. 2010-02 was introduced at a regular meeting of said council held on the 23rd day of February, 2010, that it was regularly passed and adopted by said city council, signed by the mayor, and attested by the city clerk of said city, all at a regular meeting of said council held on the 9th day of March, 2010, and that the same was passed and adopted by the following vote:

AYES: Councilmembers: Calaycay, Elderkin, Pedroza, Schroeder, Yao
NOES: Councilmembers: None
ABSENT: Councilmembers: None
ABSTAINED: Councilmembers: None

Lynne E. Fryman

City Clerk of the City of Claremont
PUBLISH: March 13, 2010

APPENDIX B

CITY OF CLAREMONT'S LOCAL HAZARD MITIGATION PLAN

City of Claremont
Local Hazard Mitigation Plan
March 7, 2022

PREPARED UNDER CONTRACT WITH
QUINNWILLIAMS

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Section 1: Introduction

Overview

The City of Claremont prepared this Local Hazard Mitigation Plan (LHMP) to guide hazard mitigation planning to better protect the people and property of the City from the effects of natural disasters and hazard events. This LHMP demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. With this LHMP, the City may be eligible for certain federal disaster assistance, specifically, the FEMA Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, and the Flood Mitigation Assistance (FMA) program.

The LHMP is a living document that should be reviewed, monitored, and updated to reflect changing conditions and new information. As required, the Plan must be updated every five years to remain in compliance with regulations and Federal mitigation grant conditions.

This LHMP is an update of the City of Claremont's 2015 Hazard Mitigation Plan approved by FEMA, March 17, 2015. This LHMP presents updated information regarding hazards being faced by Claremont as determined by the Planning Team and presents mitigation measures introduced and/or continued since 2015 to help reduce consequences from hazards, and outreach/education efforts within the community. Additionally, the Plan considers the impact of climate change.

The following FEMA definitions[1] are used throughout this plan:

Hazard Mitigation – Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Planning – The act or process of making or carrying out plans; specifically, the establishment of goals, policies, and procedures for a social or economic unit.

Purpose of Local Hazard Mitigation Plan

The City of Claremont is one of 88 cities within Los Angeles County. Claremont is located in the foothills of the San Gabriel Mountains. The City is characterized by the unique and attractive landscape that makes the area so popular. However, the potential impacts of natural hazards associated with the terrain make the environment and population vulnerable to natural disaster situations.

The City is subject to drought, earthquakes, flooding, wildfires, landslides, and windstorms, and with the events of recent years the City could also be subject to cyber

[1] FEMA, 2002, *Getting Started, Building Support for Mitigation Planning*, FEMA 386-1

attacks. It is impossible to predict exactly when these disasters will occur, or the extent to which they will affect the City. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from these natural disasters.

The inevitability of hazards, and the growing population and activity within the City create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future hazard events. Identifying the risks posed by hazards and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens and communities. Local residents and businesses can work together with the City to create a Mitigation Plan that addresses the potential impacts of hazard events.

As the costs of damage from disasters continue to increase, the City realizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation plans assist communities in reducing risk from hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The plan provides a set of action items to reduce risks from hazards through education and outreach programs and to foster the development of partnerships, and implementation of preventative activities such as land use programs that restrict and control development in areas subject to damage from hazards.

The resources and information within the Mitigation Plan:

- ✓ Establish a basis for coordination and collaboration among agencies and the public of City of Claremont;
- ✓ Identify and prioritize future mitigation projects; and
- ✓ Assist in meeting the requirements of federal assistance programs.

The Mitigation Plan works in conjunction with other City plans, including the City General Plan, Emergency Operations Plan, and Capital Improvement Plan.

Mitigation Planning Process

The process for creating the 2021 Local Hazard Mitigation Plan started with identifying members for the Planning Team. Each team member represented different City department and specific divisions within those departments with a role in mitigation efforts. The Planning Team met and identified characteristics and consequences of natural hazards with significant potential to affect the City.

Hazard mitigation strategy and goals were developed by understanding the risk posed by the identified hazards. The group also determined hazard mitigation activities and priorities to include scenarios for both present and future conditions. The final Mitigation

Plan will be implemented through various projects, changes in day-to-day city operations, and through continued hazard mitigation development.

Authority

The LHMP was prepared in response to Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) requires state and local governments to prepare Mitigation Plans to document their Mitigation Planning process, and identify hazards, potential losses, mitigation needs, goals, and strategies. This type of planning supplements the City's comprehensive emergency management program. Under DMA 2000, each state and local government must have a federally approved Mitigation Plan to be eligible for hazard mitigation grant funding.

California Senate Bill (SB) 379 passed in 2016 requires all cities and counties to include climate adaptation and resiliency strategies in the safety elements of their general plans upon the next revision beginning January 1, 2017. The bill requires the climate adaptation update to include a set of goals, policies, and objectives for their communities based on the vulnerability assessment, as well as implementation measures, including the conservation and implementation of natural infrastructure that may be used in adaptation projects. Specifically, the bill requires that upon the next revision of a general plan or local hazard mitigation plan, the safety element is to be updated as necessary to address climate adaptation and resiliency strategies applicable to the city or county.

Scope

The City's LHMP is a single jurisdictional plan that geographically covers the entire area within the City's jurisdictional boundaries and City owned facilities and land. This plan provides a framework for planning for natural hazards as well as cyber threats. The resources and background information in the plan are applicable Citywide and to City-owned facilities outside of the City boundaries, and the goals and recommendations provide groundwork for local mitigation plans and partnerships. The Regional Map of Claremont shows the regional proximity of the City to its adjoining communities.

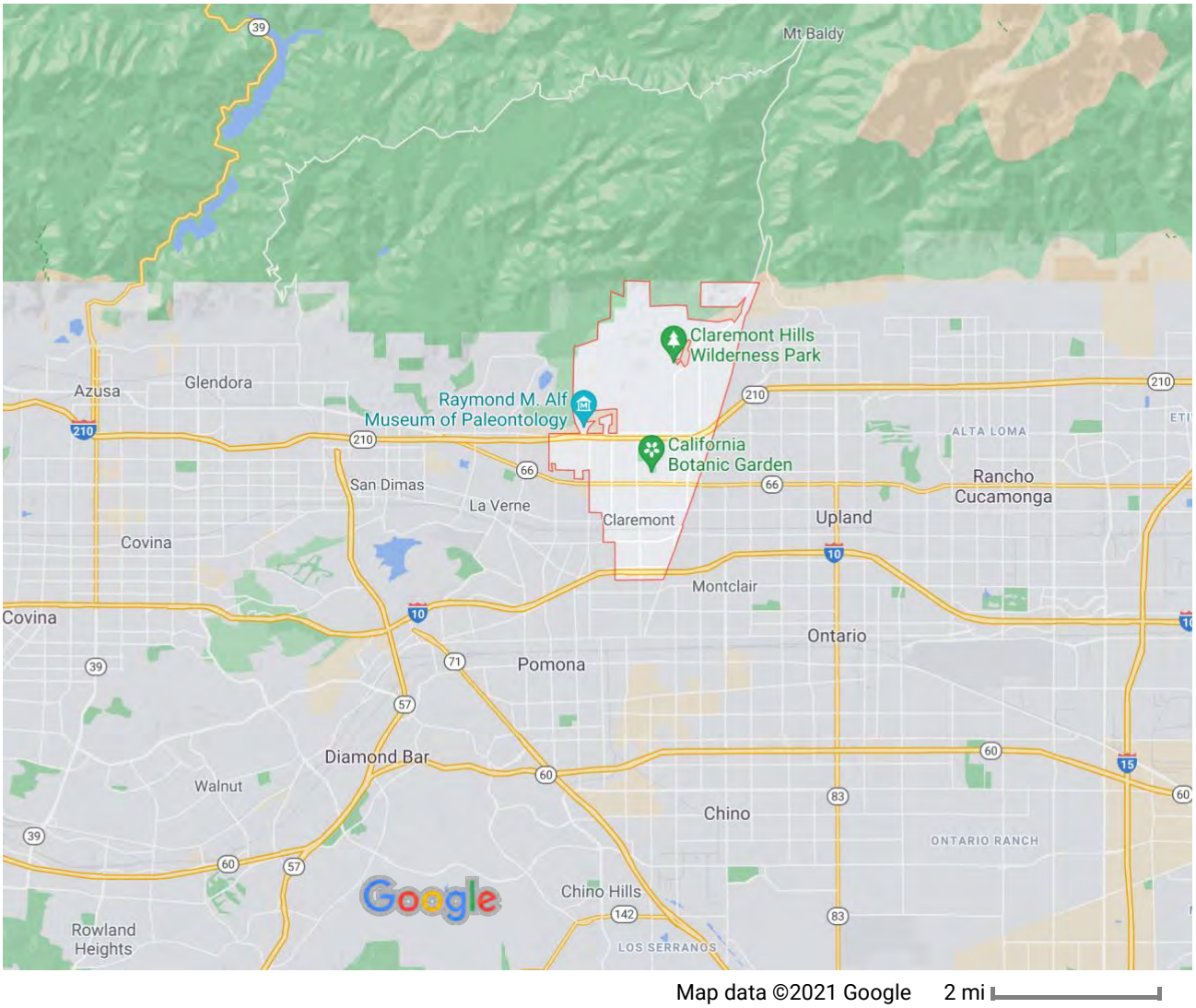
Plan Adoption

The 2021 Mitigation Plan was presented to City Council for adoption on September 14, 2021. A copy of the City Council Resolution is located in **Appendix 1**.

Plan Approval

Following incorporation of input from the City Council, the Final Draft Plan was forwarded to CalOES for review and approval and then to FEMA for final approval. FEMA issued an approval on _____.

Figure 1: Regional Map of Claremont



Source: Google Maps

Section 2: Planning Process

The process for updating the Local Hazard Mitigation Plan started with identifying members for the Planning Team, which was assembled to oversee the development of the Plan. Each team member represented different City department and specific divisions within those departments with a role in mitigation efforts. A subcommittee consisting of the Chair of the Planning Team and the Assistant City Manager was assembled, as well.

Hazard Mitigation Planning Team

Agency	Name	Department	Position
Claremont	Karlan Bennett, Chair	Police Department	Lieutenant
Claremont	Jamie Earl	City Manager's Office	Assistant City Manager
Claremont	Melissa Vollaro	Human Services	Director
Claremont	Robert Ewing	Police Department	Sergeant
Claremont	Kristin Mikula	Community Services	Manager
Claremont	Vince Ramos	Community Development	Associate Engineer
QuinnWilliams	Julie Quinn	Consultant	Partner
QuinnWilliams	Katherine Williams	Consultant	Partner

Throughout the process the Planning Team's efforts were supported by the City of Claremont and its Council members.

City of Claremont City Council

- ✓ Jennifer Stark, Mayor
- ✓ Jed Leano, Mayor Pro Tem
- ✓ Corey Calaycay, Council Member
- ✓ Sal Medina, Council Member
- ✓ Ed Reece, Council Member

Consulting Services

The update to the Plan was facilitated by the consulting group, QuinnWilliams, LLC, a woman-owned business based in Los Angeles that specializes in emergency and security preparedness.

QuinnWilliams, LLC

- ✓ Project Manager: Katherine Williams
- ✓ Senior Analyst: Julie Quinn

The Planning Team met monthly to provide guidance, review progress, identify issues, and to coordinate stakeholder meetings. The Planning Team also provided background documents and facilitated data collection.

Importantly, the Planning Team discussed whether to include any non-natural hazards such as civil unrest, cyber disruption, and epidemic/pandemic. Because of the frequency and severity of cyber disruptions in and around the Southern California region during 2020-2021, the Planning Team decided to include cyber disruption in the Plan.

Additionally, the Planning Team discussed how to best incorporate climate change into the Plan. The Planning Team made the decision to address climate change as an element of each hazard, rather than a separate hazard.

Hazard mitigation strategies and goals were developed by understanding the risk posed by the identified hazards. The Planning Team also determined hazard mitigation activities and priorities to include scenarios for both present and future conditions. The final Mitigation Plan will be implemented through various projects, changes in day-to-day city operations, and through continued hazard mitigation development.

Planning Team and Subcommittee Meetings

Table 1: Planning Team and Subcommittee Meetings

Date	Item
October 15, 2020	Planning Team kick-off meeting
November 10, 2020	Planning Team subcommittee meeting to discuss Risk Assessment Survey
November 15, 2020	Risk Assessment survey sent to Planning Team
December 3, 2020	Planning Team subcommittee meeting to discuss Risk Assessment Survey findings
December 10, 2020	Planning Team meeting to discuss Risk Assessment Survey findings
January 27, 2021	Planning Team meeting to discuss hazards for inclusion in Plan
February 10, 2021	Planning Team subcommittee meeting to discuss Hazard Vulnerability Analysis
February 24, 2021	Planning Team meeting to review draft Risk Assessment

Date	Item
March 8, 2021	Planning Team subcommittee meeting to discuss Public Outreach Meeting
March 24, 2021	Planning Team subcommittee meeting to review prior Plan's mitigation strategies and projects
April 14, 2021	Planning Team meeting to discuss current and planned mitigation strategies
April 26, 2021	Second Planning Team Meeting to discuss current and planned mitigation strategies
April 28, 2021	Planning Team subcommittee meeting to review mitigation strategies
May 12, 2021	External Stakeholder Meeting with Planning Team Subcommittee
July 30, 2021	Planning Team review of public comment on Plan

Participating Organizations

Successful mitigation planning efforts require collaboration with, and support from, federal, state, local, and regional governments; citizens; the private sector; universities; and non-profit organizations. In its process, the Planning Team consulted a variety of sources to ensure that the updated LHMP results in practicable actions tailored to meet Claremont's local needs and circumstances.

In April 2021, the Assistant City Manager sent an email inviting external stakeholders to participate in a virtual LHMP meeting. The list of potential participants included neighboring communities, local and regional agencies involved in hazard mitigation activities, representatives from agencies with the authority to regulate development, and others who had expressed interest to be involved in the planning process.

The meeting was held on May 12, 2021. The Chair of the Planning Committee and the Assistant City Manager attended on behalf of the Planning Team, as did the consultants. Following a presentation and review of the proposed updates to the Plan, the consultants facilitated a "round robin" discussion during which each stakeholder provided insight and feedback on mitigation projects impacting their area of expertise or interest.

At the conclusion of the meeting, the Assistant City Manager reviewed next steps and invited everyone to attend the next public meeting. Following the meeting, the Assistant City Manager sent a reminder email about the public meeting. The working final draft of

the LHMP was also circulated to the stakeholders via email with a request asking for their input and any suggested revisions.

Table 2: Participating Organizations

Organization/Agency	Name
Claremont Chamber of Commerce	Randy Lopez, Executive Director
Claremont InterFaith Council	Thom Johnson, President
Claremont Unified School District	Lisa Shoemaker, Assistant Superintendent
The Claremont Colleges Services	Stan Skipworth, Assistant Vice President and Director of Campus Safety
Claremont Wildlands Conservancy	Muriel Poston, Board Member
Community Emergency Response Team (CERT)	Larry Horowitz, Claremont CERT Coordinator
Disaster Management Area D	Diana Manzano-Garcia, Disaster Management Area Coordinator
Golden State Water Company	Ethan Leano, Claremont Distribution Superintendent
Los Angeles County Fire Department	Mike Inman, Assistant Fire Chief
Pomona Valley Protective Association	William McDonald, President
SoCal Edison	Marissa Castro-Salvati, Local Public Affairs Region Manager
SoCal Gas	Robert Cruz, Public Affairs Manager
Three Valleys Municipal Water District	Richard Hansen, General Manager
Tri-City Mental Health Authority	Toni Navarro, Executive Director
The Webb Schools	Theresa Smith, Head of Schools

Public Engagement

Under FEMA guidelines, local hazard mitigation planning processes should create opportunities for members of the public to be involved in plan development—at a

minimum, during the initial drafting stage and during plan approval. The Planning Team chose to go beyond minimum standards and conduct more extensive community outreach to help ensure that the LHMP reflects community values, concerns, and priorities.

Public Meetings

The LHMP update occurred in the midst of the COVID-19 pandemic. As such, in-person meetings were not an option and all community outreach was conducted virtually. To facilitate and host effective and engaging meetings, the Planning Team utilized FEMA's resource, *Virtual Meetings: Guide to Virtual Hazard Mitigation Planning Meetings.* **Appendix 2** contains a copy of the guidance.

The LHMP update also occurred in concurrence with the City's update of the safety element of its General Plan. Because with each project necessitated public outreach and engagement, City officials decided it would be most respectful of residents' time to coordinate these meetings whenever possible. The LHMP briefings were held in conjunction with the General Plan update meetings. This also allowed residents to understand more fully how the two plans interact. This was specifically important regarding climate change and its impacts in the years to come. While the LHMP has a five year timeframe, the General Plan projections look 20 to 40 years ahead, and in many cases are better suited to addressing climate-exacerbated hazards and climate change impacts.

The City held three public meetings, and notices of each meeting were widely distributed in advance in accordance with City notification requirements, the engagement strategy, legal requirements, and best practices per the FEMA guidance on virtual meetings. **Appendix 3** contains photos of the virtual meetings and power point slides that were shared.

- **Public Meeting #1 (December 17, 2020)**
  This meeting was the kick-off for public engagement Members of the public learned about the importance of an LHMP, what the Plan would include, and the timeline for developing it.

- **Public Meeting #2 (March 10, 2021)**
  members of the public learned about the hazard profiles developed for the plan and Claremont's vulnerabilities to individual hazard types. Activities at this meeting included opportunities to suggest hazard mitigation actions and to comment on others

- **Public Meeting #3 (July 14, 2021)**
  This meeting marked the beginning of the public review period. It included a discussion about how the Plan was prepared, the results of the analyses, and the chosen hazard mitigation strategies. Members of the public were also invited to comment on the Plan.

Online Engagement

The Planning Team set up a project website as a simple, one-stop location for community members to learn about the LHMP. The website included information about what an LHMP is and why the City prepared one. It had links to materials and plan documents as they became available and allowed members of the public to receive notifications about upcoming events. The Team also used social media accounts, such as Facebook, Twitter, and Instagram, to send quick notifications or bursts of information about the Plan and the development process.

Review of LHMP

On July 15, 2021, the City of Claremont released a draft copy of the LHMP for public review and comment. The document was posted electronically on the City's website, and hard copies were made available upon request. The City distributed notifications about the public review period through social media accounts and other online sources. The City received minor feedback during the public review process which was addressed and incorporated into the LHMP document.

On September 14, the LHMP was presented to the City Council for review and adoption. The LHMP was then submitted to CalOES for review and approval. Following approval by CalOES, the plan was submitted to FEMA for final approval. See **Appendix 1** for the City Council Resolution adopting the plan.

Use of Existing Data

The Planning Team gathered and reviewed existing data and plans during plan development. Numerous electronic and hard copy documents were used to support the planning process, including:

- ✓ California Department of Water Resources Inundation Maps
- ✓ California Department of Water Resources Dams Within Jurisdiction of the State of California (2020)
- ✓ Claremont General Plan
- ✓ Claremont Hills Wilderness Park Implementation Plan (2016)
- ✓ Claremont Sustainable City Plan (2021)
- ✓ County of Los Angeles All Hazards Mitigation Plan (2019 Public Draft)
- ✓ County of Los Angeles General Plan (2015)
- ✓ County of Los Angeles GIS Viewer
- ✓ HAZUS reports
- ✓ Historic GIS maps and local inventory data
- ✓ Local Flood Insurance Rate Maps
- ✓ United States Army Core of Engineers National Inventory of Dams

These documents were used as resources throughout the Plan.

Plan Maintenance

Mitigation Planning is an ongoing process involving changes as new hazards occur, as the area develops, and as more is learned about hazards and their impacts. The Planning Team will monitor changing conditions, help implement mitigation activities, annually review the plan to determine if City goals are being met, and provide an update to CalOES and FEMA every five years. In addition, the Planning Team will continue public participation in the plan maintenance process, review After-Action Reports generated after any disaster that impacts the City, and revise the mitigation plan, as needed. (See **Section 7: Plan Maintenance** for additional Information)

Section 3: Community Profile

Geography and the Environment

Claremont is located at the foothills of the San Gabriel Mountains, bounded by the Angeles National Forest to the north, City of La Verne to the west, City of Pomona to the south and the City of Montclair and City of Upland to the east. The City has an area of 13.3 square miles and elevations range from a high of about 1800' to 1100', north to south. The City's terrain is steeply sloping alluvial fan (4% grade NW to SE). The native vegetation consists of chaparral, coastal sage scrub, oak woodland, grasses, and riparian vegetation types.

The City owns 21 parks and sports fields with 2,534 acres of public parkland, of which 2,378 is wilderness. This includes the Thompson Creek Trail, a linear park following a 2.8-mile paved trail.

The City is served by the 10 and 210 freeways. The main arterial highways traveling North and South are Towne Avenue, Indian Hill Boulevard, Mills Avenue and College Avenue. The main arterial highways traveling West and East are Baseline Road, Foothill Boulevard, and Arrow Highway.

History

The area comprising the City of Claremont was a part of the San Gabriel Mission established in 1771. A claim to land was filed in 1871, and Claremont became a community when the Santa Fe Railroad connection between Los Angeles and Chicago was completed in 1887. The City of Claremont was eventually incorporated in 1907.

Below is the History of Claremont as noted by City historians and documented on the City's official website[2]:

> Much of what Claremont is today is the direct result of actions taken by the community's founders more than 100 years ago. Trees planted at the turn of the century now compete with nearby mountain peaks for dominance of the local skyline. The Claremont Colleges have become some of the nation's most highly respected educational and cultural institutions. The historic central core remains a vital residential and retail district, one of the last true "downtowns" in the region. And the spirit of Claremont's original "town meeting" form of self-governance lives on in today's active and involved citizenry—citizens who continue to build on the successes of the past in order to ensure an even brighter future.

[2] https://www.ci.claremont.ca.us/about-us/city-profile/history-of-claremont

The first known inhabitants of the Claremont region were the Tongva-Gabrielino tribe as evidenced by the discovery of a village on a mesa a few hundred yards northeast of the intersection of Foothill and Indian Hill Boulevards. In 1771, as the Spanish period in California began, Mission San Gabriel was founded, stretching from the San Bernardino Mountains to San Pedro Bay. Claremont was part of this vast tract, and many of the indigenous people (Tongva-Gabrielinos) were employed as shepherds for the padres.

After the missions were secularized by the Mexican government in 1834, most of the land within the present city limits became part of the Rancho San Jose owned by Ricardo Vejar and Don Ygnacio Palomares. Ygnacio's sister, Maria Barbara, lived with her husband and family in an adobe house in the area now known as Memorial Park. The Tongva-Gabrielinos continued to work for the Spanish settlers until smallpox took a heavy toll on the indigenous population in 1862 and 1873. By 1883, the few remaining Tongva-Gabrielinos had left the area.

Jedediah Smith, the first European man to enter California overland, passed through the Claremont region in 1826. W. T. "Tooch" Martin, the first anglo-European resident of Claremont, filed a claim on 156 acres near Indian Hill Boulevard in 1871. Martin lived by hunting game and keeping bees but eventually moved on as the population grew around him.

The Santa Fe Railroad provided the impetus for the creation of a community named Claremont in January 1887. It was one of about 30 town sites laid out between San Bernardino and Los Angeles in anticipation of a population explosion resulting from the arrival of the railroad. However, the real estate boom was short-lived. Claremont would have become one of a long list of local railroad "ghost towns" if not for the decision of the local land company to transfer its Hotel Claremont and 260 vacant lots to the recently-founded Pomona College in 1888.

The founders of Pomona College wanted to establish a school of "the New England style," and the community that grew up around it also reflected the founders' New England heritage. Even the form of local government they used, the Town Meeting, was brought with them from their hometowns in the East. Both the citizen involvement and the volunteerism on which the town meeting form of government is based continue to be hallmarks of Claremont today.

Beginning in 1904, there was talk of incorporating as a city. Proponents didn't want to rely on Los Angeles County for services, while opponents warned the community's weak tax base would result in bankruptcy in less than a year. Finally, after much debate, an election on the incorporation question was held on September 23, 1907. Nearly 95 percent of

Claremont's 131 eligible voters went to the polls. Incorporation was approved by a vote of 73 to 49, and the City of Claremont was officially incorporated on October 3, 1907.

At the same time the colleges were growing and expanding, so was the local citrus industry. Citrus ranches spread out across all the foothill communities. Claremont growers established one of the earliest citrus cooperatives for marketing and shipping citrus fruit, a model that led to the organization of the Sunkist cooperative. At its height, the industry supported four citrus packing houses, an ice house, and a precooling plant along the railroad tracks in Claremont.

Labor for the citrus industry was predominately provided by Mexican-Americans, often new arrivals from Mexico. Men served as pickers while women worked in the packing houses. By 1920, two Mexican-American neighborhoods had developed in Claremont: one in the area of El Barrio Park and the other near the packing houses west of Indian Hill Boulevard and north of the railroad. In addition to supporting the thriving citrus industry, Mexican labor contributed greatly to the early construction of the Claremont Colleges, including skilled crafting of many stone structures and ornamental features.

Citrus continued to flourish in the area until after the Second World War. That's when the pressure for residential development caused many growers to sell their land for housing tracts. The opening of the San Bernardino Freeway in 1954 also made it much easier for people not associated with citrus or the Colleges to live in Claremont. The city, which covered about 3.5 square miles at its incorporation in 1907, now covers more than 13 square miles with a population of over 34,000 residents.

The early Spanish, college, and citrus industry influences can still be seen in the community today. There are lush remnants of citrus and oak groves and a physical character reminiscent of Claremont's Spanish heritage and college-town influence. Claremont has many fine representatives of various architectural periods, particularly Victorian, neo-Classical Revival, Craftsman, and Spanish Colonial Revival. This diversity, sense of scale, and continuity singles it out as a unique community in Southern California.

Climate

The City benefits from a mild, temperate climate, with average monthly temperatures ranging from the high 40s and upper 80s. However, the temperatures can vary over a wide range, particularly when the Santa Ana winds blow, bringing higher temperatures and very low humidity. Temperatures rarely exceed 90 degrees Fahrenheit in the summer months (June-September), and rarely drop below 44 degrees Fahrenheit in the winter months (November-March).

However, according to the 2021 City of Claremont Sustainable City Plan:

> The latest research indicates that Claremont is in a "hot zone" where temperatures are increasing rapidly. These hot zones are the scenes of a critical acceleration, places where geophysical processes are amplifying the general warming trend. They suggest which parts of the Earth will suffer the largest changes. If we continue on our current path, Claremont can expect to experience an increase in its mean temperature of at least 4 degrees F by 2050.

Rainfall in the city averages 21.4 inches of rain per year.[3] It is important to note that the term "average rainfall" can be misleading because over the recorded history of rainfall in the City amounts have ranged from no rain in some years to over 40 inches of rain in very wet years.

Minerals and Soils

Claremont is largely built on old alluvial soil and the presence of rocks interspersed in the soil is very common. Due to the artesian wells in the Pilgrim Place region (in the Central liquefaction zone), that soil is softer sand. The northern mountainous area of Claraboya is largely granite, while the northwestern Piedmont Mesa area is clay. The northeast area of Padua Hills is also clay. Understanding the geologic characteristics of City of Claremont is an important step in hazard mitigation and avoiding at-risk development. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquakes, liquefaction and landslides.

Population and Demographics

According to the 2019 Census from the U.S. Census Bureau, the City of Claremont has a residential population of about 36,266. The City continues to experience an increase in density through in-fill building, which is increasing the service loads on the built infrastructure, including roads, water supply, sewer services and storm drains.

Ethnically, Claremont is a very diverse City. According the 2019 Census figures, 49% of the population identifies as White Non-Hispanic; 25% as Hispanic; 14% as Asian; 5% as Black or African American Population; 1% as American Indian/Alaska Native; and 7% of the population identifies with two or more racial groups.

[3] https://cal-adapt.org/tools/local-climate-change-snapshot/

Table 3: City of Claremont Demographics

Racial/Ethnic Group	Population (%)*
White Non-Hispanic	49
Hispanic	25
Asian	14
Black or African American	5
American Indian/Alaska Native	1
Two or More Races	7

Source: 2019 U.S. Census Population Estimates

*Total can be greater than 100% because individuals may identify as more than one race

Housing and Community Development

The City participates in the Community Development Block Grant (CDBG) program, which is the primary resource available to address non-housing community development needs is the CDBG. The U.S. Department of Housing and Urban Development (HUD) provides funding for City of Claremont's Community Program. Annually, the City receives approximately $150,000 in CDBG funds.

The City of Claremont's Community Development Department (CDD) is a multi-functional Department responsible for promoting economic development of existing business retention; orderly planning; enforcement of life safety codes; and proper grading and street improvement activities. The CDD's mission is to ensure appropriate development consistent with the City's aesthetic standards.

There has been an increasing per capita personal income in the region since the 1970's. Per capita income is an estimate of total personal income divided by the total population. According to the 2019 U.S. Census estimate, the had a per capita income of $44,546, a 27% increase from the 2010 per capita income of $35,160. This estimate can be used to compare economic areas as a whole, but it does not reflect how the income is distributed among residents of the area being examined.

The City offers a variety of housing options. While the majority of residents live in one unit detached houses, there are many living in one unit attached and multi-residential units.

Table 4: City of Claremont Housing

	Number	Percent %
Housing Type:		
1-unit, detached	8,739	69.9%
1-unit, attached	1,034	8.3%
Multi-Residential (2-19 units)	1,802	14.3%
Multi-Residential (20+ units)	913	7.3%
Mobile homes	23	0.2%
Housing Statistics:		
Total Available Housing Units	12,511	100%
Owner-Occupied Housing	7,416	66.7%
Renter-Occupied	3,705	33.3%
Vacant Housing units	595	5.1%
Average Household Size:	2.69 persons	

Source: 2019 U.S. Census Data

Employment and Industry

The City of Claremont has over 16,000 residents who are employed. Nearly 60% of those employed are in the Management, Business, Science and Arts Occupation. Nearly 20% are employed in Sales and Office occupation, and 13% in Service occupations. The City business climate has been strong and growing with concentrations in educational, health and social services, as well as management/administrative services and manufacturing. The City also has employment in production, transportation and material moving, and natural resources, construction, and maintenance.

Mitigation activities are needed at the business level to ensure the safety and welfare of workers and limit damage to industrial infrastructure. Employees are highly mobile, commuting from surrounding areas to industrial and business centers. This creates a greater dependency on roads, communications, accessibility and emergency plans to reunite people with their families. Before a natural hazard event, large and small businesses can develop strategies to prepare for natural hazards, respond efficiently, and prevent loss of life and property.

Transportation and Commuting Patterns

The City meets its public transportation needs through a mixture of a regional transit system (MTA), and various city contracted bus systems. MTA provides both bus service to the City of Claremont and to the Los Angeles County metropolitan area. In addition to this service, the City promotes alternative transportation activities. The City also promotes

the Pomona Valley Transit system, which includes the Dial-a-Ride and taxi services for residents. Amtrak buses serve the Claremont community, as does the Metrolink Rail.

Many residents in the City of Claremont work outside of the City. This may suggest that population growth is a more suburban phenomenon, where residents work in the City of Claremont but live in other communities. However, the educational establishments within the community (especially the Claremont Colleges) draw a large portion of this employment.

Section 4: Risk Assessment

Risk Assessment Overview

Risk assessment is the process of measuring the potential loss of life resulting from hazards, as well as personal injury, economic injury and property damage, in order to determine the vulnerability of people, buildings, and infrastructure to hazard events.

The four components of a risk assessment are:

- Hazard Identification;
- Profiling Hazard Events;
- Impact Assessment; and
- Assessing Vulnerability.

Hazard Identification

The Claremont Hazard Mitigation Planning Team reviewed the hazards in the 2015 LHMP (earthquake, flood, landslide, wildfire, windstorm) and identified additional hazards based on recent events (drought, civil unrest, climate change, cyber disruption and epidemic/pandemic) to be included in the Risk Assessment. The Planning Team also reviewed existing documentation to determine which of these hazards posed the most significant threat to the City. The geographic extent of each of the identified hazards was identified by the Planning Team utilizing maps and data contained in the City's General Plan and City's Emergency Operations Plan. The County of Los Angeles Hazard Mitigation Plan served as a valuable resource.

The members of the Planning Team each completed a survey to rank the hazards according to probability, magnitude/severity, warning time and duration. The results of the survey were used to determine the hazards ranking according to the Calculated Priority Risk Index (CPRI). Utilizing the Calculated Priority Risk Index (CPRI) ranking technique, the Planning Team concluded that six of the identified natural hazards posed a significant threat to the City: earthquake, flood, wildfire, landslide, drought and windstorm. The hazard ranking system is described in Table 5: Calculated Priority Risk Index, while the actual ranking is shown in Table 6: Calculated Priority Risk Index Ranking for City of Claremont. Climate Change has significant impact on many of the natural hazards identified. The Planning Team made the decision to address climate change as an element of each hazard, rather than a separate hazard. The frequency and severity of cyber disruptions in and around the Southern California region during 2020-2021 also led the Planning Team to conclude that cyber disruption is a hazard that needed to be profiled and included in the City's mitigation strategies. Table 7: Comparison of 2015 CPRI with 2020 CPRI highlights how the CPRI ranking increased for each natural hazard included in the 2015 LHMP.

Table 5: Calculated Priority Risk Index

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of occurrences or events. Annual probability of less than 1 in 1,000 years.	1	45%
	Possibly	Rare occurrences. Annual probability of between 1 in 100 years and 1 in 1,000 years.	2	
	Likely	Occasional occurrences with at least 2 or more documented historic events. Annual probability of between 1 in 10 years and 1 in 100 years.	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability of greater than 1 every year.	4	
Magnitude/ Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure. Injuries or illnesses are treatable with first aid and there are no deaths. Negligible loss of quality of life. Shut down of critical public facilities for less than 24 hours.	1	30%
	Limited	Slight property damage (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability, and there are no deaths. Moderate loss of quality of life. Shut down of critical public facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damage (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least 1 death. Shut down of critical public facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	Severe property damage (greater than 50% of critical and non-critical facilities and infrastructure). Injuries and illnesses result in permanent disability and multiple deaths. Shut down of critical public facilities for more than 1 month.	4	
Warning Time	> 24 hours	Population will receive greater than 24 hours of warning.	1	15%
	12–24 hours	Population will receive between 12-24 hours of warning.	2	
	6-12 hours	Population will receive between 6-12 hours of warning.	3	
	< 6 hours	Population will receive less than 6 hours of warning.	4	
Duration	< 6 hours	Disaster event will last less than 6 hours	1	10%
	< 24 hours	Disaster event will last less than 6-24 hours	2	
	< 1 week	Disaster event will last between 24 hours and 1 week.	3	
	> 1 week	Disaster event will last more than 1 week	4	

Source: Federal Emergency Management Agency

Table 6: Calculated Priority Risk Ranking for City of Claremont

Hazard	Probability	Weighted 45% (x.45)	Magnitude Severity	Weighted 30% (x.3)	Warning Time	Weighted 15% (x.15)	Duration	Weighted 10% (x.1)	CPRI Ranking
Cyber Disruption	2.7	1.2	2.2	0.7	3.3	0.5	3.3	0.3	2.68
Drought	2.7	1.2	1.3	0.4	1.0	0.2	4.0	0.4	2.15
Earthquake	3.3	1.5	3.8	1.2	4.0	0.6	3.8	0.4	3.63
Flood	2.2	1.0	2.3	0.7	3.5	0.5	3.5	0.4	2.55
Landslide	2.5	1.1	2.0	0.6	3.8	0.6	3.3	0.3	2.63
Wildfire	3.3	1.5	3.3	1.0	3.9	0.6	3.8	0.4	3.47
Windstorm	3.5	1.6	2.3	0.7	3.1	0.5	3.2	0.3	3.05

Comparison of Prior CPRI
The CPRI ranking increased for each natural hazard included in the 2015 LHMP.

Table 7: Comparison of 2015 CPRI with 2020 CPRI

Hazard	2015 CPRI Ranking	2020 CPRI Ranking
Earthquake	2.95	3.63
Flood	2.05	2.55
Landslide	2.20	2.63
Wildfire	3.15	3.47
Windstorm	2.00	3.05

Profiling Hazard Events

Identifying the causes and characteristics of each hazard increases the understanding of which of the City's facilities, infrastructure, and environment may be vulnerable. A profile of each hazard is provided in the Hazard-Specific Analysis in the following sections.

Table 8: Vulnerability Analysis for City of Claremont

Vulnerability: Location, Extent, and Probability for City of Claremont			
Hazard	**Location (Where)**	**Extent (How Big an Event)**	**Probability (How Often)***
Cyber Disruption	Throughout Project Area	Anywhere within the City but will generally be targeted towards government organizations or larger corporations	**Moderate - High**
Drought	Entire Project Area	Moderate to Severe Drought	**High**
Earthquake	Entire Project Area	The Southern California Earthquake Center (SCEC) in 2007 concluded that there is a 99.7 % probability that an earthquake of M6.7 or greater will hit California within 30 years.[1]	**Moderate**
Flood	Throughout Project Area	Urban Flooding from Severe Weather or Dam Inundation	**Moderate**
Landslide	Throughout the Project Area	Earthquake-induced and rain-induced landslide events possibly impacting dozens of structures.	**Moderate**
Wildfire	Northern quadrants of the City	Severe FRAP Ratings	**High**
Windstorm	Entire Project Area	50 miles per hour or greater	**Moderate**
*** Probability is defined as: Low = 1:1,000 years, Moderate = 1:100 years, High = 1:10 years**			
[1] Uniform California Earthquake Rupture Forecast			

Impact Assessment/Assessing Vulnerability

The impact assessment determines the exposure to each hazard by overlaying hazard maps with an inventory of the existing (or planned) property development(s) and population(s). Critical facilities are of particular concern because these locations provide essential equipment or provide services to the general public that are necessary to preserve important public safety, emergency response, and/or disaster recovery functions.

Risk analysis involves estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which

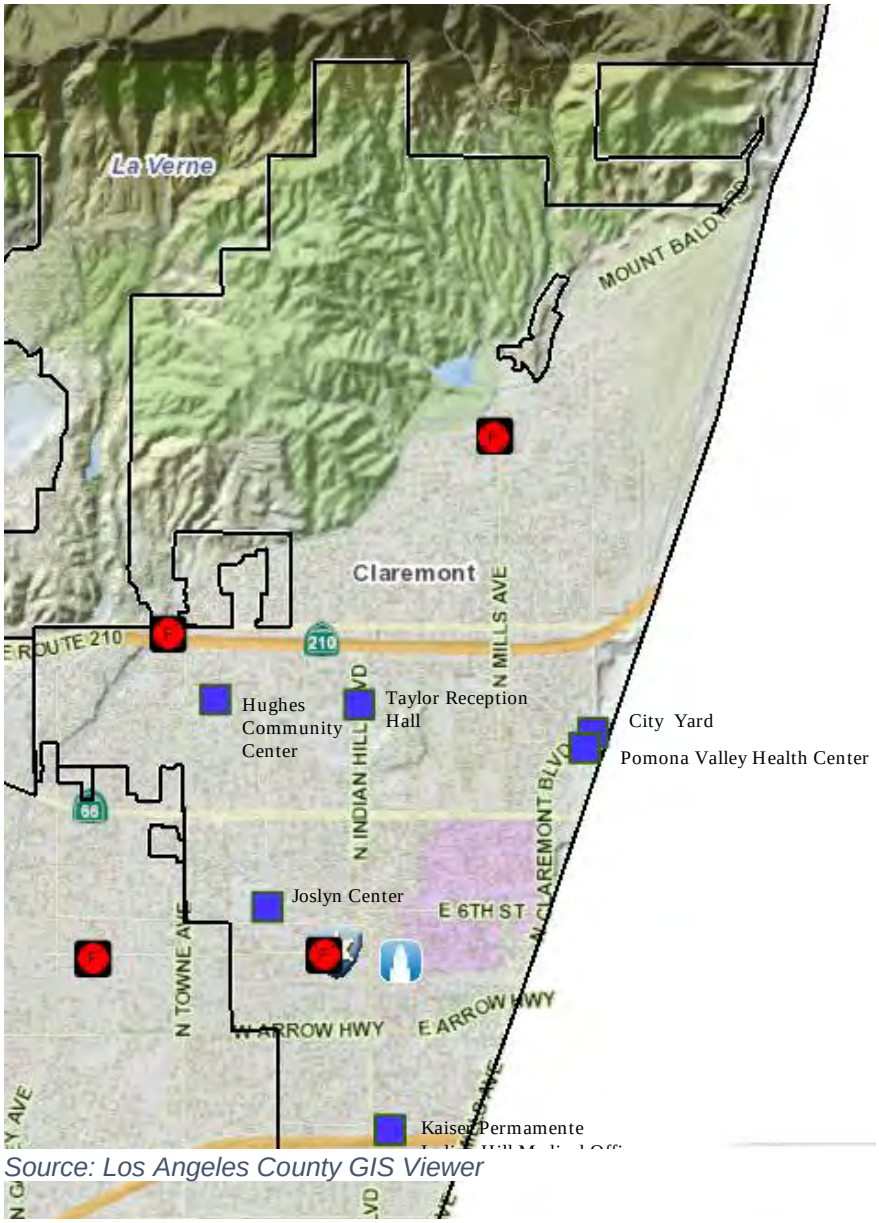
to measure the effects of hazards on assets. For each hazard where data was available, quantitative estimates for potential losses have been included in the hazard assessment. Data was not available to make vulnerability determinations in terms of dollar losses for all the identified hazards.

Critical and Essential Facilities

Facilities critical to government response activities (i.e., life safety and property and environmental protection) include: local government 9-1-1 dispatch centers, local government emergency operations centers, local police and fire stations, local public works facilities, local communications centers, schools, and hospitals.

Essential facilities are those facilities that are vital to the continued delivery of key City services or that may significantly impact the City's ability to recover from the disaster. These facilities include but are not limited to: schools, jails, law enforcement center, public services building, community corrections center, the courthouse, juvenile services building and other public facilities.

Figure 2: Map of Critical and Essential Facilities



Source: Los Angeles County GIS Viewer

Table 9: Critical and Essential Facilities Vulnerable to Hazards illustrates the critical and essential facilities within City of Claremont and the vulnerability of those facilities to the identified hazards.

Table 9: Critical and Essential Facilities Vulnerable to Hazards

Name of Facility	Cyber Disruption	Drought	Earthquake	Flood	Landslide	Wildfire	Windstorm
Critical Facilities							
City Hall 207 N. Harvard Avenue	X		X				X
Claremont Police Department 570 W. Bonita Avenue	X		X				X
County of Los Angeles Fire Station #101 660 W. Bonita Avenue	X		X				X
County of Los Angeles Fire Station #102 2040 N. Sumner Avenue	X		X			X	X
County of Los Angeles Fire Station #62 3701 N. Mills Avenue	X		X			X	X
City Yard 1615 Monte Vista Avenue	X		X				X
Essential Facilities							
Alexander Hughes Community Center 1700 Danbury Road	X		X				X
Taylor Reception Hall 1775 Indian Hill Blvd	X		X				X
Pomona Valley Health Center at Claremont 1601 Monte Vista Avenue	X		X				X
Kaiser Permanente Indian Hill Medical Offices 250 W San Jose Avenue	X		X				X
Joslyn Senior Center 660 N Mountain Avenue	X		X				X

Land and Development

The City of Claremont General Plan provides the framework for the growth and development of the City including the use and development of private land, including residential, industrial and commercial areas, as demonstrated in the Land Use Plan Map below. This Plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces. The City is currently updating their General Plan and it will include a Climate Adaption section.

Impacts to Types of Structures

The City's General Plan identifies a broad range of land uses and the building code identifies several building types. In general terms, structures are categorized as residential, commercial, institutional, or public.

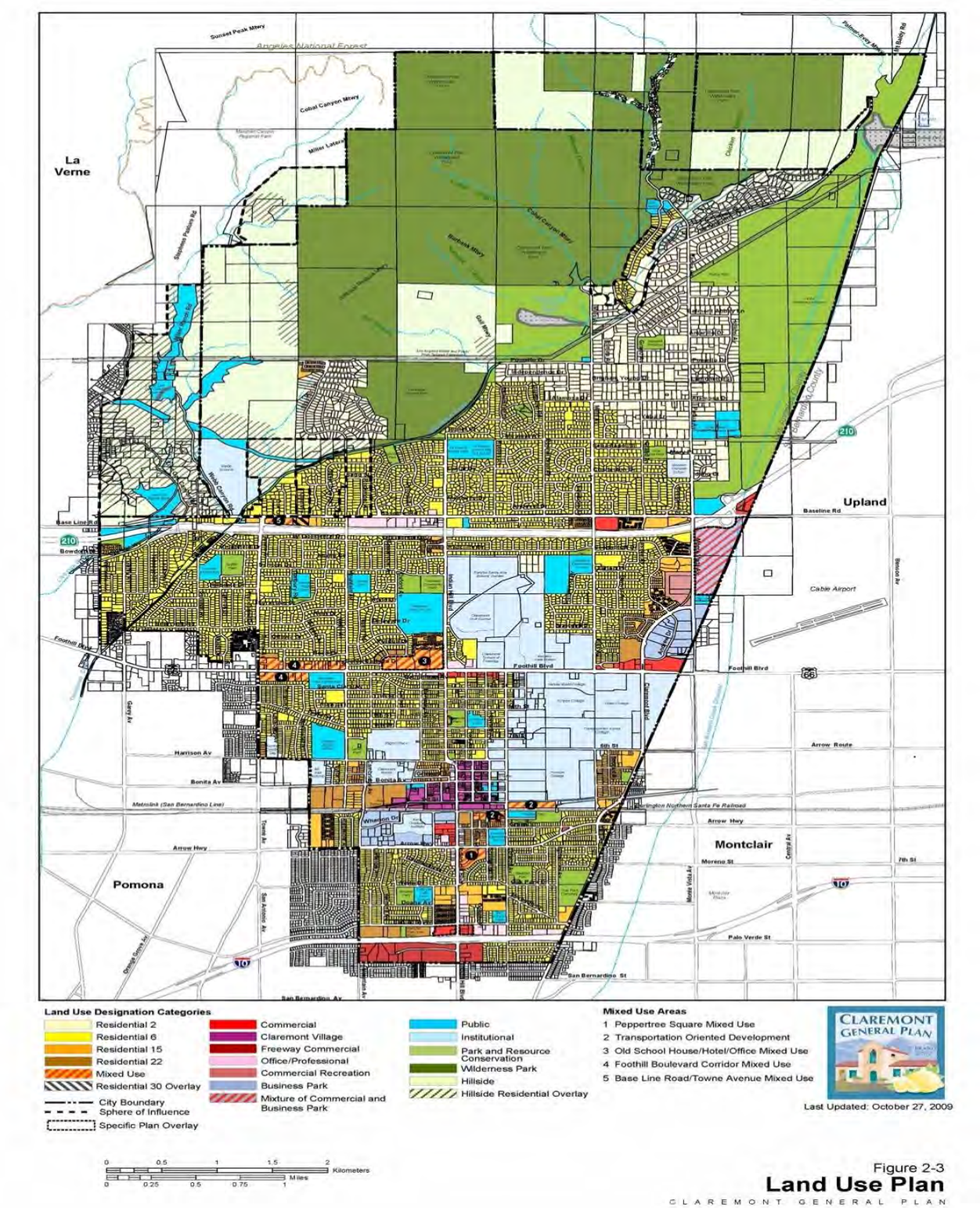
Table 10: Impacts to Existing and Future Types of Structures in the City

Category of Structure	Cyber Disruption	Drought	Earthquake	Flood	Landslide	Wildfire	Windstorm
Residential			X			X	X
Commercial			X		X	X	X
Institutional			X			X	X
Public			X		X	X	X

Source: Analysis Based on City of Claremont General Plan

Land Use Plan Map

Figure 3: Land Use Plan Map



Source: City of Claremont General Plan 2009 Summary

Claremont is vulnerable to the following natural hazards: earthquake, wildfire, windstorm, flood, drought, and landslide. Additionally, the City is vulnerable to other hazards of civil unrest, cyber disruption and pandemic/epidemic events. Because of the frequency and severity of cyber disruptions in and around the Southern California region during 2020-2021, cyber disruption is included in the hazard profiles and included in the City's mitigation strategies, along with the natural hazard. Climate change will have a significant impact on the severity, extent, frequency and length of duration for many hazards.

Hazard mitigation strategies can reduce the impacts concentrated at large employment and industrial centers, public infrastructure, and critical facilities. Hazard mitigation for industries and employers may include developing relationships with emergency management services and their employees before disaster strikes and establishing mitigation strategies together. Collaboration among the public and private sector to create mitigation plans and actions can reduce the impacts of hazards.

Hazard: Cyber Disruption

Hazard Description

A cyber disruption is a circumstance or event with the potential to exploit vulnerabilities and to adversely impact organizational operations, organizational assets (including information and information systems), individuals, other organizations, or society. A system compromise can impact one or more City agencies, a private utility, or specific critical infrastructure such as the power grid, public transportation systems, and wireless networks.

Cyber-attacks may be carried out by a variety of perpetrators, which may be external or internal to the organization. External threats originate outside of established networks and are perpetrated by groups such as organized crime, nation-state or state-affiliated entities, unaffiliated individuals, activists, former employees, acquaintances, competitors, or customers. Internal threats originate from users who have existing access to an internal network, such as employees and system administrators. Examples of cyber threats include malware and hacking, phishing, denial of service attacks, ransomware, and state-sponsored hacking. Any one of these threats, if successful, can produce a cyber-attack that has major implications throughout the organization.

Location and Extent

A cyber disruption can happen anywhere within the City but will generally be targeted towards government organizations or larger corporations. While the City has not experienced a severe incident related to a cyber-attack, the frequency of cyber-attacks on public and private sector organizations in general, continues to rise.

A cyber-attack has the potential to compromise the digital infrastructure and security of any individual or organization. Such attacks vary in nature and are perpetrated using digital mediums and social engineering. The impact of a cyber-attack may be felt for a few minutes, a few days or have longer term impacts.

Ransomware attacks may demand significant payments with monetary demands in the hundreds of thousands to millions. Even when ransoms go unpaid, cities can face significant costs. For example, the City of Baltimore experienced a ransomware attack in 2019 that cost the city more than $18 million in damages and remediation.

Previous Occurrences

In November 2019, Claremont Unified School District was the target of a ransomware attack that affected their email and internet systems. As a precaution, CUSD shut-off its servers and on-campus internet to prevent the virus from spreading Ultimately, the district engaged a cyber response team and did not pay the ransom. However, the “unplugging” impacted various components of academic life: teachers were forced to adjust their

lesson plans and lost all access to electronic gradebooks, with some grades even disappearing; and various student groups, including the yearbook committee and the newspaper, experienced severe disruptions and delays that led to the cancellation of issues and missed project deadlines.

Probability of Future Cyber Events

The probability of occurrence of cyber-attacks is rapidly increasing, especially with increased reliance on the internet and cloud-based computing. Local governments are increasingly being targeted by cyber criminals. For example, in March 2021, the Azusa Police Department was infiltrated by a hacking group that gained accessed to critical data before demanding that a ransom be paid. When the Azusa Police Department declined to pay, hundreds of sensitive documents, including criminal case files and payroll data were released online. However, the probability of a cyber-attack affecting the City is difficult to calculate given that human behavior is unpredictable.

Climate Change Considerations

While there is little evidence to link climate change to an increase in occurrences of cyber-attacks, the target could be related to persons/groups with issues with individuals or companies they perceive to have effect on the climate (i.e., greenhouse gas producers).

Impact

Many aspects of life in the City – from the delivery of water and electricity, to transportation, life safety, and emergency response – have become deeply reliant on technology. For infrastructure if industries related to utilities, health care, transportation, social services, and telecommunications are targeted.

Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Disruption of and damage to public infrastructure
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community

this reason, the impact of a cyber-attack could take many forms.

A cyber incident could affect a system's:

- Confidentiality: protecting a user's private information.
- Integrity: ensuring that data is protected and cannot be altered by unauthorized parties.
- Availability: keeping services running and giving administration access to key networks and controls

Cyber incidents can damage public trust in the institutions that were once considered stable and secure. A cyber incident can have wide-ranging effects on public and private

Summary of Claremont's Vulnerability to Cyber-attack

Cyber-attacks represent a growing threat to cities across America. There is potential for significant losses caused by a cyber disruption or ransomware attack to Claremont.

Hazard: Drought

Hazard Description

Drought is the result of a decline in precipitation over an extended period, typically one or more seasons in length. The primary impact of a drought is the reduction of available water supplies. Droughts can cause harm to natural environments as plants do not get the water that they need to survive. In severe cases, droughts may lead to a human health risk if available water supplies are not sufficient to meet basic needs. Indirectly, drought causes soils to dry out; as a result, the soil is less able to absorb water. When precipitation returns the amount of runoff increases, which can lead to flooding. Dry soil is more susceptible to erosion and landslides because it does not bind together as well. Drought causes many plants in natural areas to dry out, making them more susceptible to pest/diseases and increasing the risk of wildfires.

Location and Extent

All areas of Claremont face the same risk of drought, as droughts are regional events,. It is also possible for communities to experience a "long-distance drought," since many urban areas in California receive water supplies from great distances. If these distant areas experience drought, it may cause water shortages in the urban areas that rely on them. The most common scale for measuring drought conditions is the U.S. Drought Monitor Classification Scheme. This rating system is a synthesis of multiple different scales into a descriptive index, shown in Table 11: U.S. Drought Monitor Classification Scheme.

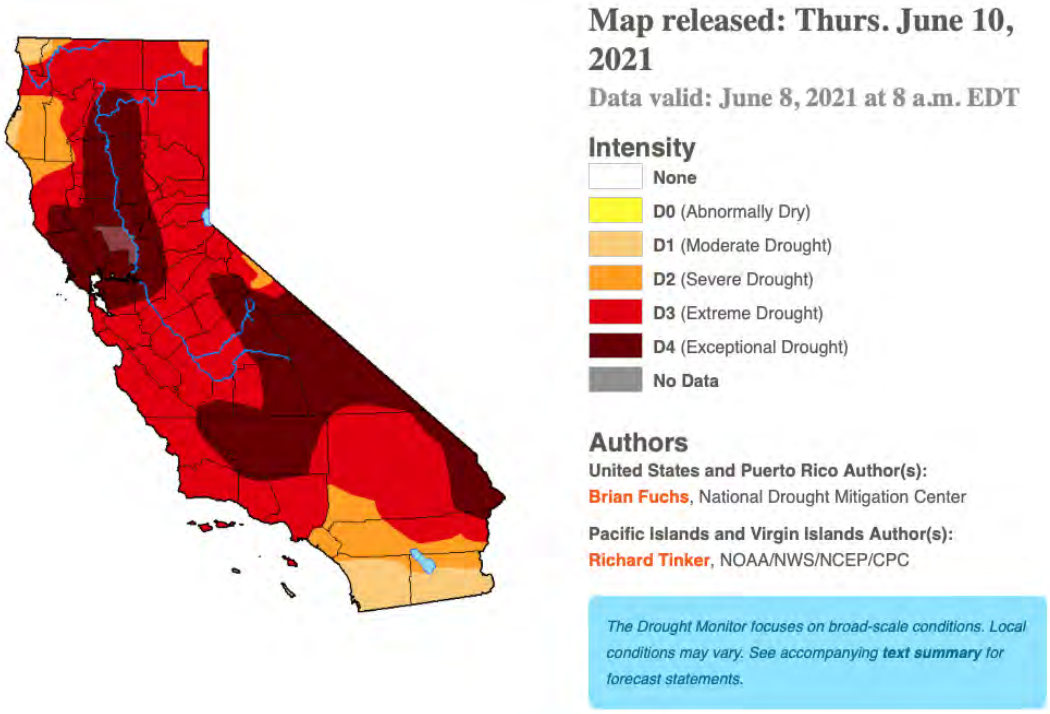
Table 11: U.S. Drought Monitor Classification Scheme

Category	Description	Relevant California-specific possible impacts
D0	Abnormally Dry	• Soil is dry; irrigation delivery begins early • Active fire season begins
D1	Moderate Drought	• Landscaping and gardens need irrigation earlier; wildlife patterns begin to change • Stock ponds and creeks are lower than usual
D2	Severe Drought	• Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent; more fire crews are on staff • Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase • River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	• Fire season lasts year-round; fires occur in typically wet parts of state; burn bans are implemented • Wildlife encroach on developed areas; little native food and water is available for bears, which hibernate less

		• Water sanitation is a concern, reservoir levels drop significantly, surface water is nearly dry, flows are very low; water theft occurs • Water conservation rebate programs increase; water use restrictions are implemented; water transfers increase • Water is inadequate for agriculture, wildlife, and urban needs; reservoirs are extremely low; hydropower is restricted
D4	Exceptional Drought	• Fire season is very costly; number of fires and area burned are extensive • Many recreational activities are affected • Fish rescue and relocation begins; pine beetle infestation occurs; forest mortality is high; wetlands dry up; survival of native plants and animals is low; fewer wildflowers bloom; wildlife death is widespread; algae blooms appear • Poor air quality affects health; greenhouse gas emissions increase as hydropower production decreases; West Nile Virus outbreaks rise • Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are extremely low; junior water rights are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Los Angeles County, including Claremont, experienced a drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. As of June 2021, 85% of the state of California was experiencing an extreme (D3) or exceptional drought (D4) (exceptional drought). Claremont was in a state of D3 (extreme drought).

Figure 4: California Drought Conditions June 2021



Source: U.S. Drought Monitor

Previous Occurrences

Drought is a cyclic part of the climate of California, occurring in both summer and winter, with an average recurrence interval between three and ten years. The National Oceanic an Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI)[4] estimates that the droughts that California experienced since 2000 have cost between $10-20 billion.

The list below details the droughts California has experienced over the past 50 years.

- 1975-1977, Statewide - California experienced a serious drought due to low precipitation. The drought dramatically lowered reservoir levels across California, leading to widespread water shortages.
- 1987-1992, Statewide - California experienced another serious drought due to low participation and runoff levels.
- 2007-2009, Statewide - In February 2009, the state proclaimed a statewide drought for the first time.
- 2012-2017, Significant - Prolonged Statewide drought.

[4] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2021). https://www.ncdc.noaa.gov/billions/, DOI: 10.25921/stkw-7w73

The 2012-2017 drought was one of the most significant droughts in California's history. Governor Brown declared a statewide drought emergency in January 2014 and Californians were asked to voluntarily reduce their water consumption by 20 percent. Drought conditions worsened and in April 2015 the governor announced actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response, and invest in new technologies to make California more drought-resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent on average.

Probability of Future Events

Researchers for California's Fourth Climate Change Assessment have noted that California has a "highly variable climate" with wet or dry periods that can span years and that are "heavily affected by extreme precipitation events." Furthermore, climate scientists also suggest the possibility of longer and more destructive droughts with climate change. As such, California is likely to experience long-term droughts at least every decade.

The Golden State Water Company receives a mixture of local groundwater and imported water from the State Water Project and the Colorado River via the Three Valleys Municipal Water District (part of Metropolitan Water District of Southern California). Groundwater is also resilient to drought because groundwater basins can hold large volumes of water that have built up over an extended time. Groundwater basins are refilled by local precipitation that filters through the ground (a process called recharge).

In most droughts in California, surface water sources can typically supply only a reduced amount of water, and in some cases supply may be depleted entirely. The risk that future drought conditions would substantially affect Claremont is to some degree lessened by the large volume of groundwater in local water supplies. However, a substantial portion of the community's water is imported, and these supplies are more vulnerable to drought. Overall, Claremont may be relatively unaffected by short-term droughts, but longer-term droughts that affect groundwater supplies will have more significant effects.

Climate Change Considerations

Overall, climate change is likely to decrease precipitation levels throughout the state, though there will likely be significant variation in year-to-year rainfall. Although changes to precipitation levels may be unclear, climate change is projected to result in more frequent and severe droughts, partly due to the greater variability in precipitation levels. Warmer temperatures mean that less precipitation will fall as snow, and that any snow that does fall will melt faster. The accumulated snow of the winter (known as snowpack) is a major source of water in California's dry season, but climate change is expected to reduce the water available from this source, particularly at the end of the dry season. Additionally, according to Cal-Adapt, recent research suggests that a mega drought

(extended drought conditions that could persist as long as 20 years) could become more pervasive in future decades.

Impact of Drought on Claremont

Severe droughts can impact the region's agriculture, forests, hydropower, groundwater supply, recreation, aquatic ecosystems, as well as isolated communities that have limited water supply.

Lifelines and Critical Facilities

No structures will be directly affected by drought conditions, though some structures may become vulnerable to wildfires, which are more likely following years of drought.

Natural Environment

The ecosystems in and around Claremont are well adapted to drought conditions, but much more frequent and/or intense drought events may harm these natural environments. In addition to the direct damage to the local ecosystems, this may have economic impacts on the community.

Economic Impact

A prolonged drought can affect a community's economy significantly. Increased demand for water and electricity may result in shortages and higher costs of these resources. Although most businesses will still be operational, they may be affected aesthetically—especially the recreation and tourism industry. Significant economic impact will be largely associated with industries that use water or depend on water for their business. Moreover, droughts within another area could affect food supply and price for City residents.

Non-Quantifiable Impacts

Drought will continue to have potentially negative economic impacts to the City. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Economic Impact
- ✓ Water Reduction Policies
- ✓ Secondary Impacts of wildfire

Summary of Claremont's Vulnerability to Drought

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier and northern California will get hotter. The resulting loss of snowpack in the Sierra Nevada will mean less water for all Californians – farmers, residents, utilities, and even hatchery fish. However, while drought cannot be controlled, according to the USGS, drought can be managed in two ways: through drought planning and in helping communities make the best day-to-day management decisions while the drought is taking place.

Hazard: Earthquake

Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. Earthquakes usually occur without warning and in certain instances can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can further amplify ground motions. The severity of these effects is dependent on the amount of energy released from the fault or epicenter.

Earthquakes are classified by the amount of energy released, measured as magnitude, and the impact on people and structures, measured as intensity. Magnitude is commonly expressed by ratings on the Richter scale and the Moment Magnitude (Mw) scale; the Mw scale is currently the most commonly used magnitude scale. Earthquake intensity is measured with the Modified Mercalli Intensity Scale, which measures felt intensity, and peak ground acceleration (PGA), which expresses the severity of an earthquake and is a measure of how hard the earth shakes, or accelerates, in a given geographic area.

Earthquake Related Hazards

In addition to ground shaking, secondary hazards associated with earthquakes are landslides and liquefaction. The severity of these hazards depend on several factors, including soil and slope conditions, proximity to the fault and earthquake magnitude.

Landslides

Earthquake-induced landslides occur as a result of the ground shaking. Generally, these consist of rock falls, disrupted soil slides, rock slides, soil lateral spreads, soil slumps, soil block slides, and soil avalanches. Areas having the potential for earthquake-induced landslides generally occur in areas of previous landslide movement.

Liquefaction

Liquefaction is a phenomenon in which loose, wet soil is suddenly shaken, causing the soil to behave more like a fluid and lose its stability. Liquefaction occurs in saturated soils – soils in which the space between individual soil particles is completely filled with water. The water exerts a pressure on the soil particles which influences how tightly the particles themselves are pressed together. Prior to an earthquake, water pressure may be relatively low but earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. Because liquefaction only occurs in saturated soil, its effects are most commonly observed in low lying areas. Typically, liquefaction is associated with shallow groundwater, water less than 50 feet beneath the earth’s surface.

Liquefied soil loses much or all of its stability, which results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these structures. Structures located on soils such as silt or sand may experience significant damage during an earthquake due to the instability of structural foundations and the moving earth.

Location and Extent

The City of Claremont lies within a metropolitan area that has historically been seismically active. Faults are prevalent throughout California and are commonly classified as either “active” or “potentially active.” An active fault is a break that has moved in recent geologic time (the last 11,000 years) and that is likely to move within the next approximately 100 years. Active faults are the primary focus of concern in attempting to prevent earthquake hazards.

Several active faults have been identified within or adjacent to the boundaries of the Claremont Planning Area, which indicates that the community falls under the Alquist-Priolo Earthquake Fault Zoning Act of 1972 and the Seismic Hazards Mapping Act of 1990. These acts require that during the General Plan update process local governments must adopt policies and criteria to ensure the structural adequacy of buildings erected across active faults for human occupancy and identify areas prone to liquefaction and amplified ground shaking. In some cases, the development of structures is prohibited. Verification that the above acts pertain to Claremont was obtained through correspondence with the State Department of Conservation and is on file with the City Planning Division.

Historic patterns show that any of the minor or major faults traversing the Southern California region are capable of causing significant disruption. Despite the fact that Claremont faces limited threats from interior seismicity, there are a number of active faults in Southern California that could potentially move and thus result in hazards to the community.

Earthquakes that could affect the City would most likely originate from the Sierra Madre, Whittier, San Jose or San Andreas Fault Zones. These faults are close enough in proximity or expected to generate strong enough shaking that could affect the City. The level of seismicity in Claremont, both as to maximum credible earthquake intensity and likely earthquake occurrences, is considered to be approximately the same as for the Los Angeles Basin.

- **Sierra Madre**: The Sierra Madre fault runs along the southern margin of the San Gabriel Mountains and is related to the Cucamonga Fault to the east and San Fernando Fault Zone to the west.

- **Whittier**: The Whittier fault runs approximately 40 kilometers between the cities of Chino Hills and Whittier and is one of the two upper branches of the Elsinore Fault Zone. An earthquake with a magnitude M 5.44 was recorded in 2008.

- **San Jose:** The San Jose fault runs for approximately 18 kilometers in the ares of Claremont and Pomona. Two earthquakes each of magnitude greater than 5.0 were recorded in 1988 and 1990.

- **San Andreas**: The San Andreas Fault is the longest and most significant fault in California. Because of clearly established historical earthquake activity, this fault has been designated as active by the State of California. The last major earthquake on this fault in the region was the Fort Tejon earthquake of 1857, which was estimated at M 8.0 and would have caused considerable damage if there had been structures in the southern part of the county.

Although there are several faults within the vicinity of the City, Claremont has never been severely impacted by an earthquake.

Figure 5: Map of Fault Lines in the Vicinity of Claremont



Source: Los Angeles County GIS Viewer

Landslides

Landslides can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes.

As a hillside community, Claremont is at-risk for landslides along the foothills of the San Gabriel Mountains. Areas considered for earthquake-induced landslides are generally found in the Hill and Canyon area of the City and are shown on the Maps depicting Landslide and Liquefaction Zones in Claremont (Figures 6 and 7). The landslide potential zones were compiled from USGS. Mapped earthquake-induced landslide potential zones are intended to prompt more detailed, site specific geotechnical studies as required by the Seismic Hazard Mapping Act.

Liquefaction

Many communities in Southern California are built on ancient river bottoms and have sandy soil. In some cases, this ground may be subject to liquefaction, depending on the depth of the water table.

Liquefaction has been a major cause of earthquake damage in Southern California. During the 1971 San Fernando and 1994 Northridge earthquakes, significant damage to roads, utility pipelines, buildings, and other structures in the Los Angeles area were caused by liquefaction. Research and historical data indicate that loose, granular materials situated at depths of less than 50 feet with fines (silt and clay) contents of less than 30 percent, which are saturated by a relatively shallow groundwater table are most susceptible to liquefaction. These geological and groundwater conditions exist in parts of Southern California and Claremont, typically in valley regions and alleviated floodplains.

For liquefaction to occur, three general conditions must be met. The first condition – strong ground shaking of relatively long duration – can be expected to occur in the Claremont area as a result of an earthquake on any of the several active faults in the region. The second condition – loose, or unconsolidated, recently deposited sediments consisting primarily of silt and sand – occurs in a large portion of the valley floors, and in the larger canyon bottoms prevalent throughout Los Angeles County. The third condition is water saturated sediments within approximately 50 feet of the surface.

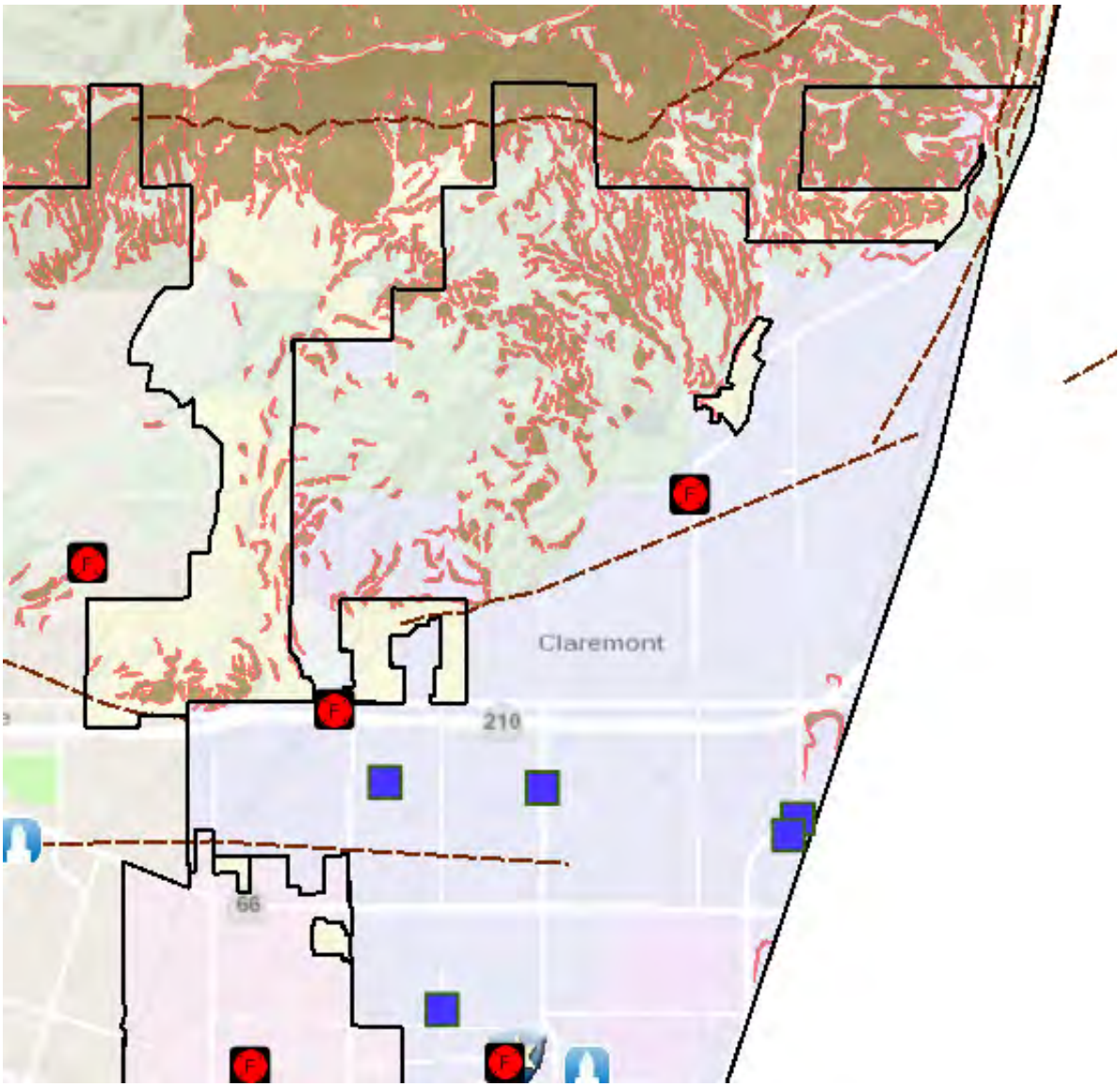
In the City of Claremont, the groundwater table (used to determine the risk of liquefaction) is generally more than 100 feet below the surface, except in a few areas where clay lenses exist. This results in a lack of groundwater near the surface, leaving much of the City in a low liquefaction-risk area. Additionally, the alluvial soils upon which Claremont is built facilitate liquefaction prevention.

However, there are two areas within Claremont that are identified as Liquefaction Zones. Area 1 starts just north of Foothill Boulevard, going down to just south of Harrison Avenue, and lies east of Baughman Drive and west of College Avenue. There are two parks, Sycamore Elementary School, Claremont School of Theology, Pilgrim Place, approximately 300 homes and two business/shopping centers within or bordering Area 1.

Area 2 starts just North of Scripps Drive, sloping northwest across Thompson Creek into County-run areas. On the east side it is bordered by Thompson Creek and is a half block west of Mountain Avenue on the southwest side. Fire Station #101, Webb School, Sunrise Assisted Living Center, a Water Reservoir, a Power Station, the 210 Freeway, Thompson Creek, and approximately 200 homes are within or border Area 2.

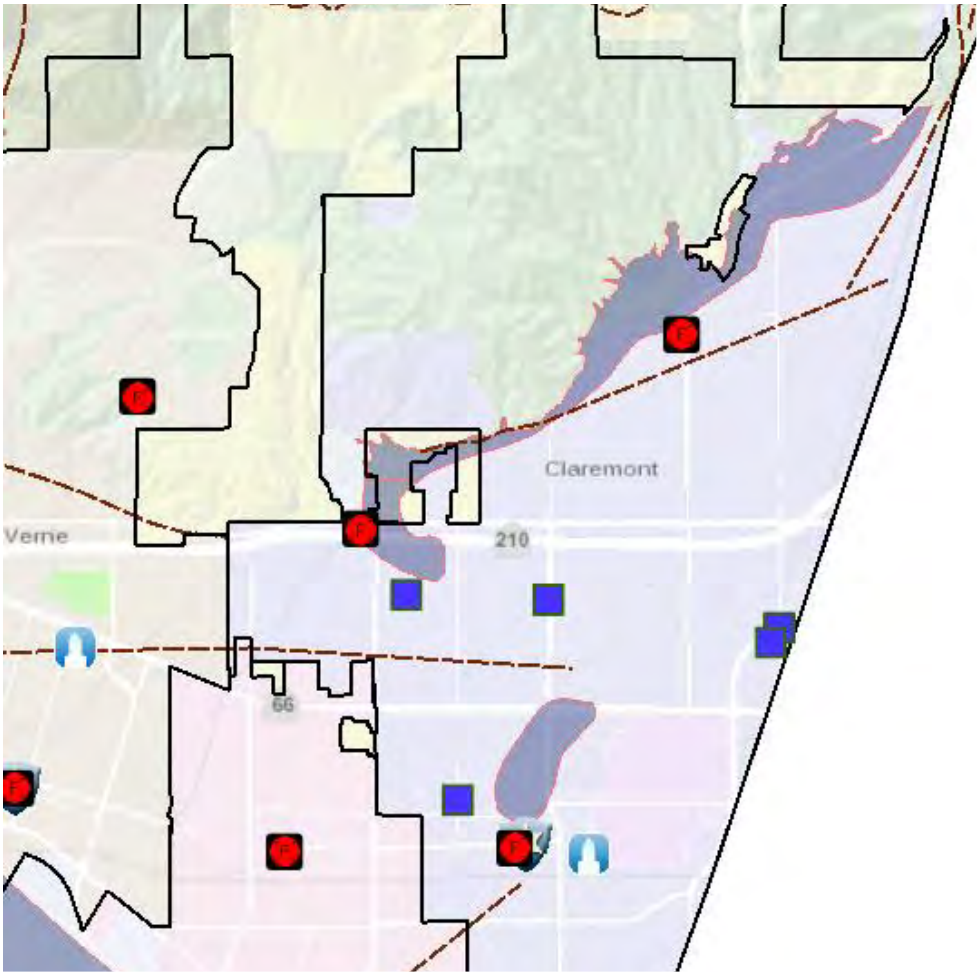
In accordance with the Seismic Hazard Mapping Act, the California Division of Mines and Geology has evaluated liquefaction susceptibility for most of the Claremont area. Figure 6: Landslide Zones in Claremont and Figure 7: Liquefaction Zones in Claremont show the results of these studies.

Figure 6: Landslide Zones in Claremont



Source: Los Angeles County GIS Viewer

Figure 7: Liquefaction Zones in Claremont



Source: Los Angeles County GIS Viewer

Previous Occurrences

Southern California has a history of powerful and relatively frequent earthquakes, dating back to the powerful magnitude 8.0+ 1857 San Andreas Earthquake which did substantial damage to the relatively few buildings that existed at the time. During the twentieth century, many earthquakes have shaken Claremont. Notable events that affected wide areas of Southern California include the 1933 Long Beach, 1971 Sylmar, and 1987 Whittier earthquakes. In 1992, Claremont was shaken by two events: a M 7.3 earthquake originating from the desert community of Landers and a M 6.4 in Big Bear. The Northridge tremor of 1994 rattled windows and nerves throughout the City, but Claremont was spared the widespread destruction experienced in the San Fernando Valley. In 1988 and 1990, earthquakes with a magnitude of 5.5 centered in Claremont caused minor structural damages. In 1994, the region experienced the M 6.7 Northridge earthquake. In 2019, Ridgecrest, approximately 100 miles north of Claremont, experienced a M 6.4 earthquake followed two days later by a M 7.1 earthquake, the largest experienced in the region since 1952.

Historically, the City of Claremont has generally been spared a major destructive earthquake. However, based on a search of earthquake databases of the United States Geological Survey (USGS) - National Earthquake Information Center (NEIC), several major earthquakes (Magnitude 6.0 or more) have been recorded within approximately 100 kilometers of the project area since 1769.

Probability of Future Events

The 2007 Working Group on California Earthquake Probabilities (WGCEP 2007), a multi-disciplinary collaboration of scientists and engineers, released the Uniform California Earthquake Rupture Forecast (UCERF), the first comprehensive framework for comparing earthquake possibilities throughout all of California, in 2007. In developing the UCERF, the 2007 Working Group revised earlier forecasts for Southern California (WGCEP 1995) and the San Francisco Bay Area (WGCEP 2003) by incorporating new data on active faults and an improved scientific understanding of how faults rupture to produce large earthquakes. It extended the forecast across the entire state using a uniform methodology, allowing for the first time, meaningful comparisons of earthquake probabilities in urbanized areas such as Los Angeles and San Francisco Bay Area, as well as comparisons among the large faults in different parts of the State. The study was organized by the Southern California Earthquake Center, the U.S. Geological Survey, and the California Geological Survey, and it received major support from the California Earthquake Authority, which is responsible for setting earthquake insurance rates statewide. In 2015, the latest version, the forecast was updated and according to the UCERF (Version 3)[5], the probability of an earthquake of magnitude 6.7 or larger in the Los Angeles area over the next 25 years is 60%.

Climate Change Considerations

There is no evidence of any link between climate change and seismic activity that could affect conditions in Claremont. Climate change is not expected to cause any changes to the frequency or severity of earthquake events.

Impact of Earthquake on Claremont

A significant earthquake along one of the major faults could result in substantial casualties, extensive damage to buildings, roads and bridges, fires, dam failure and other threats to life and property. A major earthquake could be catastrophic in its effect on the population. Such an earthquake could exceed the response capabilities of the individual cities, Los Angeles County Operational Area, and the State of California Emergency Management Agency. Support of damage control and disaster relief could be required from other local governments and private organizations, as well as the state and federal governments.

[5] https://pubs.usgs.gov/fs/2015/3009/pdf/fs2015-3009.pdf

Emergency operations could be seriously hampered by the loss of communications and damage to transportation routes within, and to and from, the disaster area and by the disruption of public utilities and services. Extensive search and rescue operations could be required to assist trapped persons. Mass evacuation could be essential to save lives, particularly in areas downwind from hazardous material releases. Emergency medical care, food, and temporary shelter could be required by injured or displaced persons.

Many families could be separated, particularly if the earthquake occurs during working hours. A personal inquiry or locator system could be essential to maintain morale. Emergency operations could be seriously hampered by a loss of communications, damage to transportation routes, and/or disruption of public utilities and services.

The economic impact on the City from a major earthquake would be considerable in terms of loss of employment and loss of tax base. Also, a major earthquake could cause serious damage and/or outage to critical infrastructure. The loss of such facilities could curtail or seriously disrupt the operations of banks, insurance companies, and other elements of the financial community. In turn, this could affect the ability of local government, business and the population to make payments and purchases.

Extensive federal assistance could be required and could continue for an extended period. Efforts would be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and welfare for the affected population, including temporary housing for displaced persons.

The time of day and season of the year would have a profound impact on the number of dead and injured. In general, the population is less at risk during non-work hours (if at home) as wood-frame structures are relatively less vulnerable to major structural damage than are typical commercial and industrial buildings. Transportation problems are intensified if an earthquake occurs during work hours, as significant numbers of employees would be stranded in the City. An earthquake occurring during work hours would clearly create major transportation problems for those displaced workers.

Historical Impact: Northridge Earthquake

The most recent significant earthquake event affecting Southern California was the January 17, 1994 Northridge Earthquake. At 4:31 A.M. on Monday, January 17, a moderate but very damaging earthquake with a magnitude of 6.7 struck the San Fernando Valley. In the following days and weeks, thousands of aftershocks occurred, causing additional damage to affected structures.

Fifty-seven people were killed and more than 1,500 people seriously injured. For days afterward, thousands of homes and businesses were without electricity; tens of thousands had no gas; and nearly 50,000 had little or no water. Approximately 15,000 structures were moderately to severely damaged, which left thousands of people temporarily homeless; 66,500 buildings were inspected. Nearly 4,000 were severely damaged and over 11,000 were moderately damaged. Several collapsed bridges and overpasses created commuter havoc on the freeway system. Extensive damage was caused by ground shaking, but earthquake triggered liquefaction and dozens of fires also caused additional severe damage. This extremely strong ground motion in large portions of Los Angeles County resulted in record economic losses.

Structure Failure

A substantial amount of construction has occurred in Claremont under design standards that take into account some of the lessons learned from the 1971 Sylmar earthquake. Because most of the structures and infrastructure in Claremont have recently been built under modern building codes, it is possible to survive the maximum expected earthquake with relatively moderate losses. Possible geologic effects of a likely major earthquake in Claremont include:

- Rupture of the ground surface associated directly with movement on geologic faults. The likelihood of an event such as this is prevalent; however it would be focused in the foothill portions of the City, which are not as densely populated as the alluvial portions.
- Ground failure due to liquefaction (a momentary quick condition, similar to quicksand) could occur in Claremont wherever the right combination of perched water and low density, sandy material exists. Liquefaction conditions may occur in areas along the canyon and wash areas located at the base of the foothills and in isolated areas.
- Ground shaking with moderate to high lateral accelerations would be the primary seismic effect in the City.
- In general, complete collapse of buildings is not likely to occur and building damage is likely to be only moderate. However, partial to total collapse could occur among the very few pre-1933 buildings still existing, and partial collapse of some tilt-up and concrete block buildings built prior to March 1972 must be counted as a possibility, based on the evidence of the Sylmar earthquake. The majority of

construction has been under modern building codes. Where current state-of-the-art seismic evaluations can enter into all future development, and where disaster preparedness is being maintained, it is possible to survive the maximum expected earthquake with relatively moderate losses.

Nonquantifiable Impacts

It is evident that earthquakes will continue to have potentially devastating impacts to certain areas of the City. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life;
- ✓ Commercial and residential structural damage;
- ✓ Disruption of and damage to public infrastructure;
- ✓ Damage to roads/bridges resulting in loss of mobility;
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community;
- ✓ Negative impact on commercial and residential property values; and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Summary of Claremont's Vulnerability to Earthquakes

The impacts of a high magnitude earthquake can span a large area; a large earthquake occurring in Southern California region could possibly be felt throughout the region. However, the degree to which the earthquakes are felt, and the damages associated with them, may vary. At risk from earthquake damage are large stocks of old buildings and bridges: many high tech and hazardous materials facilities: extensive sewer, water, and natural gas pipelines; earth dams; petroleum pipelines; and other critical facilities and private property located in the county. The relative or secondary earthquake hazards, which are liquefaction, ground shaking, and earthquake-induced landslides, can be just as devastating as the earthquake.

Hazard: Flood

Hazard Description

A flood occurs when the existing channel of a stream, river, canyon, or other watercourse cannot contain excess runoff from rainfall or snowmelt, resulting in overflow onto adjacent lands.

Floods usually occur during the season of highest precipitation or during heavy rainfalls after prolonged dry periods. The City is dry during the late spring, summer, and early fall, and receives most of its rain during the winter months. The rainfall season extends from November through April, with approximately 95% of the annual rainfall occurring during this period. The City averages 17 inches of precipitation per year.

Over the last 140 years, the average annual rainfall in Los Angeles County has been approximately 15 inches, though the annual rainfall during this time period has varied widely. For example, the 2006-2007 season recorded only 3.21 inches of rainfall, and the 2004-2005 recorded 37.25 inches. The City of Claremont is in the eastern section of the Los Angeles Basin (or San Gabriel Valley), against the San Gabriel Mountains, which increases the collection of rainwater.

Floods are dangerous for a number of reasons. Moving water is very strong; it can damage buildings and/or carry large debris that damages objects in its path. Moving water can wash away soil, weakening structures and potentially leading to partial or complete collapse. There is no single type of flood or one area most prone to flooding.

Urban Flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds, to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in flood waters that rise very rapidly and peak with violent force.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

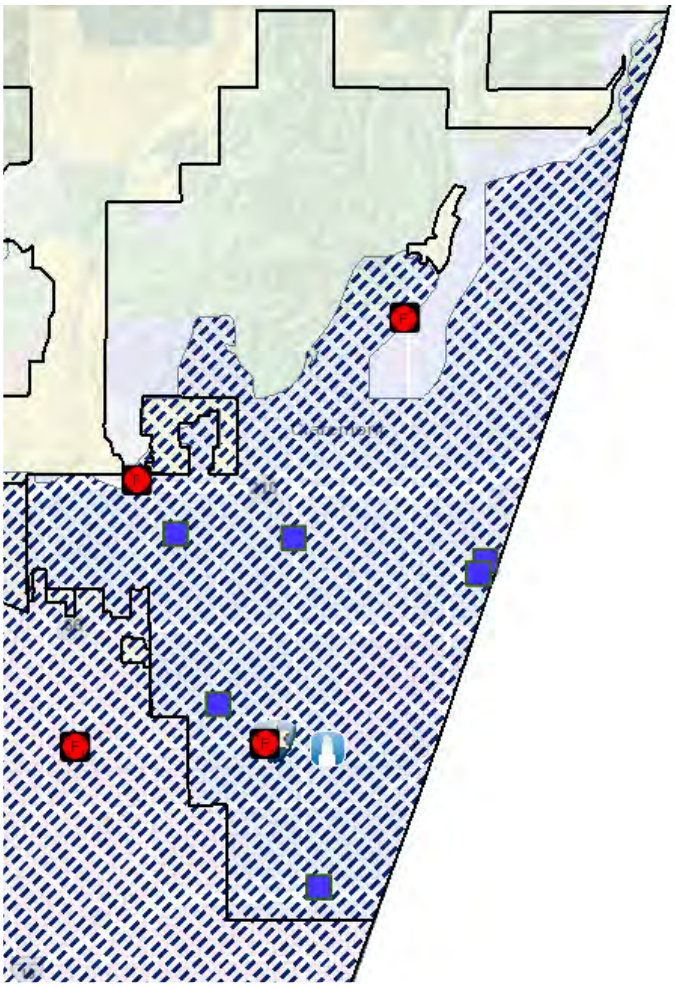
Location and Extent

The size and frequency of a flood in a particular area, depends on a complex combination of conditions, including the amount, intensity, and distribution of rainfall previous moisture condition and drainage patterns.

The magnitude of a flood is measured in terms of its peak discharge, which is the maximum volume of water passing a point along a channel in a given amount of time, usually expressed in cubic feet per second (cfs). Floods are usually referred to in terms of their chance of occurrence. For example, a 100-year flood has a 1% chance of occurring in any given year.

FEMA establishes base flood heights and inundation areas for 100-year and 500-year flood zones. The 100-year flood is defined as a flood which has a one percent probability of occurring in any given year (one in 100). The 500-year flood is defined as a flood which has a 0.2 percent probability of occurring in any given year (one in 500). The 100-year zone is the area that is vulnerable to that designated flood.

Figure 9: Map of 500 Year Floodplain



Source: Los Angeles County GIS Viewer

The City of Claremont is vulnerable to both slow-rise and flash flooding. Slow-rise floods in Claremont may be preceded by a warning period of hours or days. Evacuation and sandbagging for slow-rise floods have often effectively lessened flood related damage. Conversely, flash floods are most difficult to prepare for, due to extremely limited, if any, advance warning and preparation time. Slow-rise flooding in Claremont is usually the result of one or a combination of the following factors: extremely heavy rainfall, saturated soil, area recently burned in wildfires with inadequate new ground cover growth, or heavy rainfall with runoff from melting mountain snow.

The City of Claremont is adjacent to three rivers that make the City susceptible to flooding events: San Antonio River, Thompson Creek Channel, and Chicken Creek. The largest threat to flooding in Claremont comes from dam inundation. There is also the risk of urban flooding resulting from heavy rainfall.

Dam Inundation

According to the City of Claremont SEMS Multi-Hazard Functional Plan, there are three dams or reservoirs in or near the City of Claremont with a total capacity of 9922 acre-feet of water or 3.2 billion gallons of water (1 acre-foot=325,851 gallons).

There are two dams that are owned by the Los Angeles County Department of Public Works, both are in satisfactory condition:

- Thompson Creek Dam, built in 1928
- Live Oak Dam, built in 1922

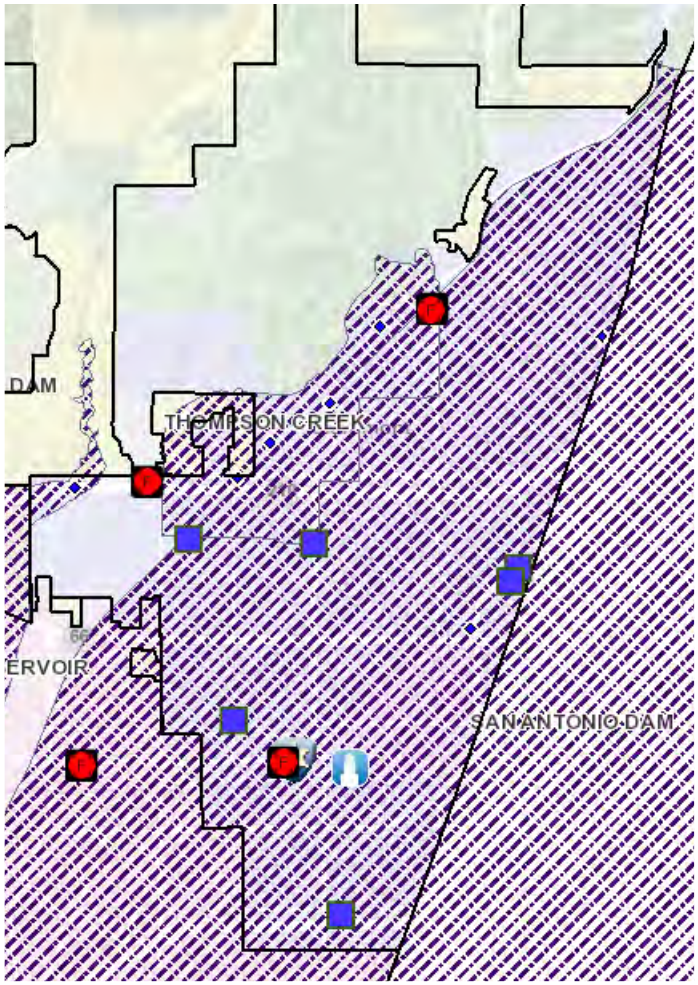
Both dams have a classified “high” downstream hazard, meaning the potential downstream impact to life and property would be “expected to cause loss of at least one human life.” However, as they have been classified in satisfactory condition, as defined by the National Inventory of Dams, the definition used by the California Division of Safety of Dams, they are not eligible for FEMA’s Rehabilitation of High Hazard Potential Dams (HHPD) program. Satisfactory condition means that there is “no existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria or tolerable risk guidelines.”

The San Antonio Dam is federally owned and was built in 1956. Based on a 2014 risk assessment conducted by the Army Core of Engineers, the incremental risk of the San Antonio Dam is considered to be low. As a federally owned dam, the San Antonio Dam is also ineligible for the FEMA HHPD program.

Because dam failure can have severe consequences, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Although there may be coordination with county officials in the development of the EAP, the responsibility for developing potential flood inundation maps and facilitation of emergency response is the responsibility of the dam owner.

In the case of dam inundation, the areas affected would extend over a large area (south to the I-10 and west to White Avenue in La Verne in the case of the San Antonio Dam), or a smaller area (Foothills area of the City and south of just south of Base Line Road in the case of the Thompson Creek Dam and a small area in Western Claremont in the case of the Live Oak Dam). For more detailed information regarding dam failure flooding, and potential flood inundation zones for a particular dam in the county, refer to the City of Claremont SEMS Multi-Hazard Functional Plan.

Figure 10: Dam Inundation Areas



Source: Los Angeles County GIS Viewer

Urban Flooding

Almost 25% of the area in the City has a high concentration of impermeable surfaces that either collect water or concentrate the flow of water in unnatural channels. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding. Drainage systems within the City of Claremont have been updated and it is

anticipated that they would be fully functional in an emergency. (Source: Claremont General Plan)

Participation in the National Flood Insurance Program

Claremont participates in the National Flood Insurance Program (NFIP). Created by Congress in 1968, the NFIP makes flood insurance available in communities that enact minimum floodplain management rules consistent with the Code of Federal Regulations §60.3. The NFIP also reduces flood losses through regulations that focus on building codes and sound floodplain management. NFIP regulations require that all new construction in floodplains must be elevated at or above base flood level.

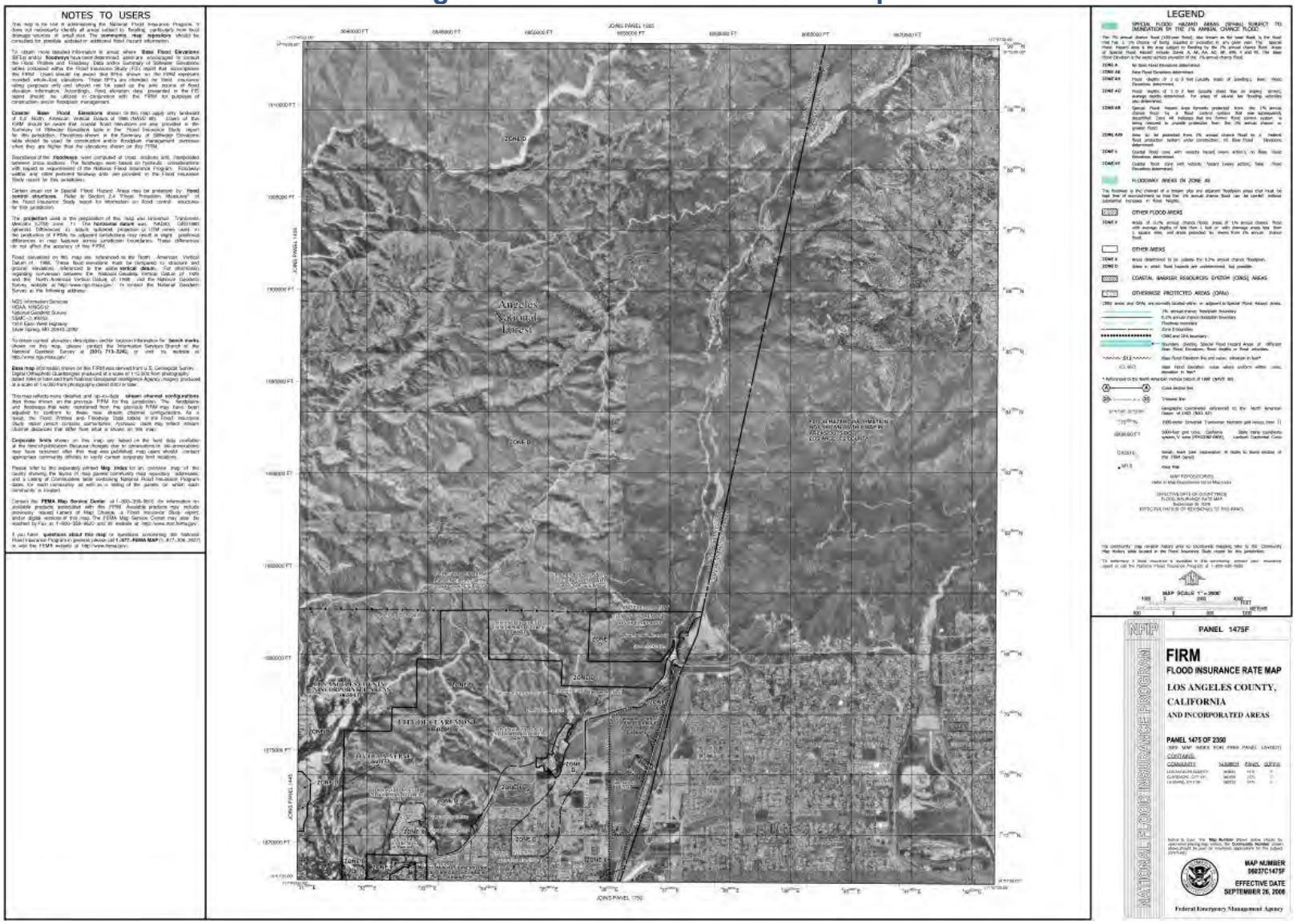
According to FEMA, the built areas of the City are in Flood Zone X, meaning that the area is not located within a 100-yearflood plain. FEMA maps showing areas that require flood insurance are maintained at City Hall.

Mapping Floods in Claremont

A Flood Insurance Rate Map (FIRM) is the official map produced by FEMA which delineates Special Flood Hazard Area (SFHA) in communities where NFIP regulations apply. FIRMs are also used by insurance agents and mortgage lenders to determine if flood insurance is required and what insurance rates should apply. Water surface elevations are combined with topographic data to develop FIRMs. FIRMs illustrate areas that would be inundated during a 100-year flood, floodway areas, and elevations marking the 100-year-flood level.

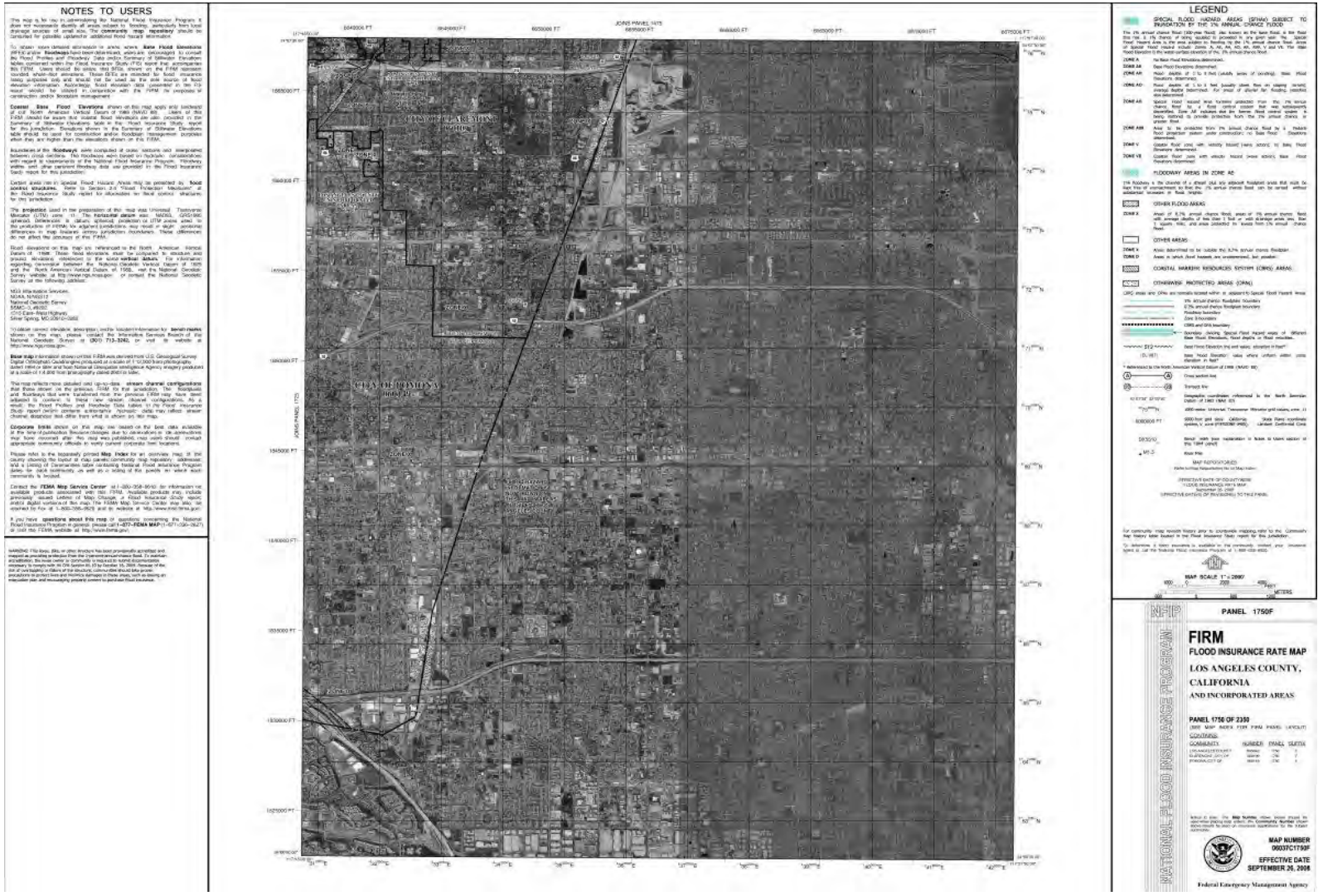
SFHAs are areas at or below a flood elevation that has a one percent or greater probability of being equaled or exceeded during any given year (this is also known as a 100-year flood event). This flood, which is referred to as the base flood, is the national standard on which the floodplain management and insurance requirements of the NFIP are based.

Figure 11: Flood Insurance Rate Map 1



Source: FEMA, NFIP

Figure 12: Flood Insurance Rate Map 2



Source: FEMA, NFIP

Previous Occurrences

Historically, flooding has been an issue in Claremont, as storm runoff from Mount Baldy rushes rapidly down the many canyons that outlet onto the Claremont alluvial plain. In 1938, a tremendous flood hit Claremont, damaging many properties and destroying most City streets. Over $350,000 in damage was done (calculated in 1938 dollars), and there were eight fatalities. There was severe damage was to the roadways as well as to many homes and the Claremont Colleges. Floods also occurred in 1941 and 1943.

However, since completion of the San Antonio Dam in 1956, the structure has served important flood control and water supply functions for Claremont. Localized flooding is still an issue during heavy rainfall, but the dam has halted most of the severe floods. (Source: City of Claremont General Plan). Since construction of the Dam, only two flooding incidents have affected Claremont both occurring in1969. During the month of January 1969, Mount Baldy recorded a record 50.85” of rainfall over ten days. Because of the San Antonio Dam, Claremont received little damage as compared to surrounding communities. This decrease in damage was likely due to the protection provided by preventative efforts, such as flood channels and the dam.

Probability of Future Events

Flooding is a recurring event in Los Angeles County. Claremont will continue to be at risk for flood events.

Climate Change Considerations

Climate change is expected to increase the average intensity of atmospheric river storms that affect Southern California. The increase in intensity could increase the number of flood events, because there may be storms severe enough to overwhelm existing flood control and drainage infrastructure. Climate change may also increase the severity of the most intense flooding, because the severe atmospheric river storms that often cause such events are projected to become 10 to 20 percent more intense. It is unclear whether any changes to the climate may affect the frequency or intensity of flooding in Claremont. It is possible that droughts, which are expected to occur with greater frequency and to be more intense as a result of climate change, may exacerbate flooding. Dry soil cannot absorb water as easily, which can lead to ponding and increased runoff when rains do return.

Impact of Flooding on Claremont

Floods and their impacts vary by location and severity of any given flood event, and likely only affect certain areas of the county during specific times.

Property Loss Resulting from Flooding Events

The type of property damage caused by flood events depends on the depth and velocity of the flood waters. Faster moving flood waters can wash buildings off their foundations and sweep cars downstream. Pipelines, bridges, and other infrastructure can be damaged when high waters combine with flood debris. Extensive damage can be caused by basement flooding and landslide damage related to soil saturation from flood events. Most flood damage is caused by water saturating materials susceptible to loss (i.e., wood, insulation, wallboard, fabric, furnishings, floor coverings, and appliances). In many cases, flood damage to homes renders them unlivable.

Business/Industry

Flood events impact businesses by damaging property and by interrupting business. Flood events can cut off customer access to a business as well as close a business for repairs. A quick response to the needs of businesses affected by flood events can help a community maintain economic vitality in the face of flood damage. Responses to business damages can include funding to assist owners in elevating or relocating flood-prone business structures.

Public Infrastructure

Publicly owned facilities are a key component of daily life for all citizens of the county. Damage to public water and sewer systems, transportation networks, flood control facilities, emergency facilities, and offices can hinder the ability of the government to deliver services. Government can take action to reduce risk to public infrastructure from flood events, as well as craft public policy that reduces risk to private property from flood events.

Roads

During hazard events, or any type of emergency or disaster, dependable road connections are critical for providing emergency services. Road systems in the City of Claremont are maintained by multiple jurisdictions. Federal, state, county, and city governments all have a stake in protecting roads from flood damage. Road networks often traverse floodplain and floodway areas. Transportation agencies responsible for road maintenance are typically aware of roads at risk from flooding.

Bridges

Bridges are key points of concern during flood events because they are important links in road networks and they can be obstructions in watercourses, inhibiting the flow of water during flood events. The bridges in the City of Claremont are state, county, city, or privately owned. A state-designated inspector must inspect all state, county, and city bridges every two years; but private bridges are not inspected and can be very dangerous.

The inspections are rigorous, looking at everything from seismic capability to erosion and scour.

The five highest priority bridges in the City of Claremont are currently mitigated to more fully withstand potential natural disasters. The highest priority bridge is located on Mountain Avenue at the base of Claraboya residential area. This is high priority because if this bridge is destroyed, there is no other exit route for those living north of it in the Claraboya/Johnson's Pasture area. Other priority bridges include the Freeway Bridges (3 on the I-10 and approximately 11 on the I-210).

Storm Water Systems

Local drainage problems are common throughout the City. The City of Claremont Community Services staff is aware of local drainage threats. The problems are often present where storm water runoff enters culverts or goes underground into storm sewers. Inadequate maintenance can also contribute to the flood hazard in urban areas.

Debris in the Storm Drains

Storm water pollution is urban runoff water that picks up pollutants as it flows through the storm drain system – a network of channels, gutters and pipes that collect runoff from city streets, neighborhoods, farms, construction sites and parking lots – and empties directly into local waterways.

Unlike sewage, which goes to treatment plants, urban runoff flows untreated through the storm drain system. Anything thrown, swept or poured into the street, gutter or a catch basin – the curbside openings that lead into the storm drain system – can flow directly into our channels, creeks, bays and ocean. This includes pollutants like trash, pet waste, cigarette butts, motor oil, anti-freeze, runoff from pesticides and fertilizers, paint from brushes and containers rinsed in the gutter, and toxic household chemicals.

Contaminated urban runoff is an uncontrolled nonpoint source of pollution into local waters, and contributes to beach closures. Litter, leaves and other debris can clog catch basins causing flooding when it rains. Storm water pollution may contribute to beach closures, which hurt local businesses, tourism and Los Angeles County's image as a desirable place to live and work. It is illegal for businesses without a permit to discharge wastewater or other materials into the storm drain system.

Water/Wastewater Treatment Facilities

The City of Claremont lies within Sanitary District #21 in the City of Claremont, and operates sewage treatment facilities. There is one major water service company in the City of Claremont, although there are multiple water sources. These sources include the Three Valley Municipal Water District and various groundwater sources from the Inland Valley.

Water Quality

Environmental quality problems include bacteria, toxins, and pollution. The City of Claremont has high levels of nitrates within the water system. General pollution problems are not as evident within the City.

Nonquantifiable Impacts

Impact that is not quantified, but anticipated in future events includes:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards (e.g., mold and mildew)
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed

Summary of Claremont's Vulnerability to Flood

Claremont has a long history of moderate to severe flooding during major storms. The establishment of the San Antonio Dam has mitigated much of the problem. However, flooding remains a potential problem, particularly as climate change can bring more frequent and severe storms.

Hazard: Landslide

Hazard Description

A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. The term “landslide” encompasses events such as rock falls, topples, slides, spreads, and flows. Landslides can be initiated by rainfall, earthquakes, volcanic activity, changes in groundwater, and/or a change of a slope caused by construction activities.

Landslides can be broken into two categories: rapidly moving (generally known as debris flows) and slow moving. Rapidly moving landslides or debris flows present the greatest risk to human life, and people living in or traveling through areas prone to rapidly moving landslides are at increased risk of serious injury. Slow moving landslides can cause significant property damage but are less likely to result in serious human injuries.

Landslides vary greatly in their volume of rock and soil, the length, width, and depth of the area affected, frequency of occurrence, and speed of movement. Some characteristics that determine the type of landslide are slope of the hillside, moisture content, and the nature of the underlying materials. Landslides are given different names, depending on the type of failure, and their composition and characteristics.

A debris or mud flow is a river of rock, earth and other materials, including vegetation that is saturated with water. This high percentage of water gives the debris flow a very rapid rate of movement down a slope. Debris flows often with speeds greater than 20 mile per hour, and often move much faster. This high rate of speed makes debris flows extremely dangerous to people and property in its path.

Wildland fires in hills covered with chaparral are often a precursor to debris flows in burned out canyons. The extreme heat of a wildfire creates a soil condition in which the earth becomes impervious to water by creating a waxy-like layer just below the ground surface. Since the water cannot be absorbed into the soil, it rapidly accumulates on slopes, often gathering loose particles of soil into a sheet of mud and debris. Debris flows often originate miles away from unsuspecting persons and approaches at a high rate of speed with little warning.

Natural processes can cause landslides or re-activate historical landslide sites. The removal or undercutting of shoreline-supporting material along bodies of water by currents and waves produces countless small slides each year. Seismic tremors can trigger landslides on slopes historically known to have landslide movement. Earthquakes also cause additional failure (lateral spreading) that occurs on gentle slopes above steep streams and riverbanks.

Location and Extent

Landslides are a common hazard in California. Weathering and the decomposition of geologic materials produces conditions conducive to landslides, and human activity further exacerbates many landslide problems.

Debris flows travel down a hillside with speeds up to 200 miles per hour (more commonly, 30 – 50 miles per hour), depending on the slope angle, water content, and type of earth and debris in the flow. These flows are initiated by heavy, usually sustained, periods of rainfall, but sometimes happen as a result of short bursts of concentrated rainfall in susceptible areas. Burned areas charred by wildfires are particularly susceptible to debris flows, given certain soil characteristics and slope conditions.

Although landslides are a natural geologic process, the incidence of landslides and the impact on people are exacerbated by human activities. Grading for road construction and development increases slope steepness and decreases the stability of a hill slope by adding weight to the top of the slope, removing support at the base of the slope, and increasing water content. Other human activity affecting landslides include: excavation, drainage and groundwater alterations, and changes in vegetation.

Excavation and Grading

Slope excavation is common in the development of home sites or roads on sloping terrain. Grading these slopes results in slopes that are steeper than the pre-existing natural slopes. Since slope steepness is a major factor in landslides, these steeper slopes are at an increased risk for landslides.

The added weight of fill placed on slopes also results in an increased landslide hazard. Small landslides are fairly common along roads, in either the road cut or the road fill. Landslides occurring below new construction sites are indicators of the potential impacts stemming from excavation.

Drainage and Groundwater Alterations

Water flowing through or above ground is often the trigger for landslides. Any activity that increases the amount of water flowing into landslide-prone slopes increases landslide hazards. Broken or leaking water and sewer lines can be especially problematic. However, even lawn irrigation in landslide prone locations can result in damaging landslides. Ineffective storm water management and excess runoff also cause erosion and increase the risk of landslide hazards. Drainage is affected naturally by the geology and topography of an area. Development that results in an increase in impervious surface impairs the ability of the land to absorb water and redirects water to other areas. Channels, streams, ponding, and erosion on slopes indicate potential slope problems.

Road and driveway drains, gutters, downspouts, and other constructed drainage facilities concentrates and accelerates flow. Ground saturation and concentrated velocity flow are major causes of slope problems and triggers landslides.

Changes in Vegetation

Removing vegetation from very steep slopes increases landslide hazards. Areas that experience wildfire and land clearing for development may have long periods of increased landslide hazard. Changing from native ground cover plants to ground cover that require constant watering to remain green can increase the risk of landslide.

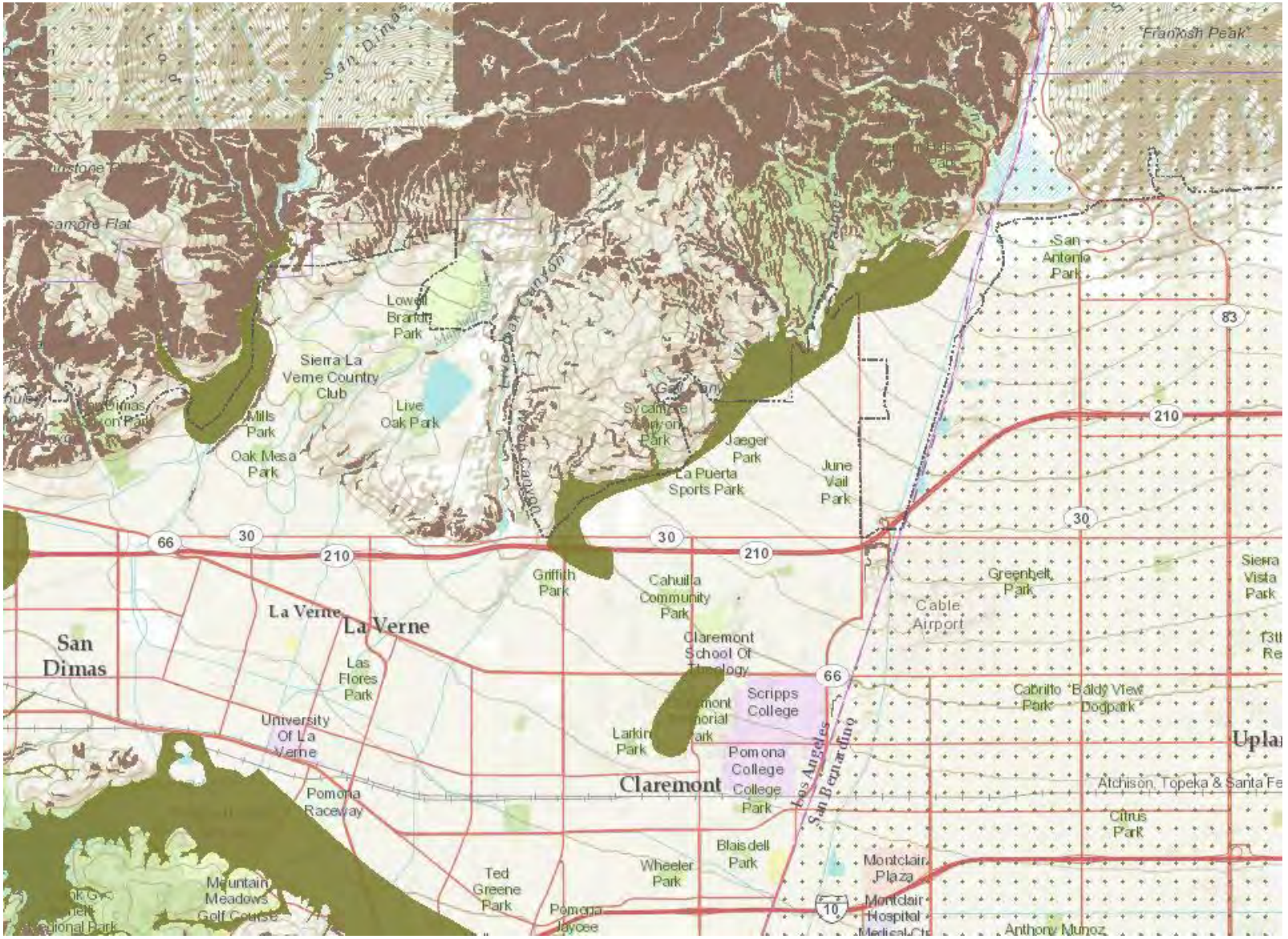
Areas Particularly Susceptible to Landslides

Locations at risk from landslides or debris flows include areas with one or more of the following conditions:

- On or close to steep hills
- Steep road-cuts or excavations
- Existing landslides or places of known historic landslides (such sites often have tilted power lines, trees tilted in various directions, cracks in the ground, and irregular-surfaced ground)
- Steep areas where surface runoff is channeled, such as below culverts, V-shaped valleys, canyon bottoms, and steep stream channels
- Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons
- Canyon areas below hillside and mountains that recently (within 1-6 years) were subjected to a wildland fire

Figure 13: Claremont Landslide Hazard Map shows deep seated landslide susceptibility areas in Claremont.

Figure 13: Claremont Landslide Hazard Map



Source: CalOES

Previous Occurrences

In 1969, the Glendora landslip significantly impacted Claremont causing $26.9 million in damages. Over 175 houses were damaged, mainly by debris flows. More recently, in January and February of 2019, heavy rains caused a landslide in the Angeles National Forest north of Claremont and generated over 3,500 tons of debris that had to be removed by Los Angeles County Public Works.

Other significant landslides in the region over the past 30 years include:

- **1994 Northridge Earthquake Landslides** As a result of the Magnitude 6.7 Northridge Earthquake, more than 11,000 landslides occurred over an area of 10,000 km^2. Most were in the Santa Susana Mountains and in mountains north of the Santa Clara River Valley. The landslides destroyed dozens of homes, blocked roads, and damaged oil-field infrastructure.
- **March 1995, Los Angeles and Ventura Counties** Above normal rainfall triggered damaging debris flows, deep-seated landslides, and flooding. Several deep-seated landslides were triggered by the storms, the most notable was the La Conchita landslide, which in combination with a local debris flow, destroyed or badly damaged 11 to 12 homes in the small town of La Conchita, about 20 km west of Ventura. There also was widespread debris-flow and flood damage to homes, commercial buildings, and roads and highways in areas along the Malibu coast that had been devastated by wildfire two years before.
- **January 2005, Ventura County** A landslide struck the community of La Conchita, killing ten people and destroying or seriously damaging 36 houses.
- **January 2018, Santa Barbara County** In December 2017 the Thomas Fire ravaged areas in Santa Barbara county, burning large amounts of vegetation whose roots had helped stabilize topsoil in hillsides and other vulnerable areas. On January 8, 2018 a storm brought heavy rains; the mudflows began the next day. There were 23 deaths and 163 people hospitalized. Over 100 homes were destroyed and another 300 damaged.
- **December 2018, Malibu** Heavy rain on the Woolsey Fire burned hillsides created debris flows and mudslides in and around Malibu causing several road closures.

Probability of Future Events

Claremont will continue to be at risk for landslides due to the hilly terrain, risk of wildfire and potential for earthquake-induced landslides. Moisture-induced landslides may occur as a consequence of intense storms or winters with heavy rainfall.

Climate Change Considerations

There is no known link between climate change and seismic activity, therefore climate change is not expected to have any effect on earthquake-induced landslides. However, climate change may increase the frequency and/or intensity of moisture-induced landslides. Atmospheric river storms may become more intense as a result of climate change. This causes more precipitation to be absorbed by the soil which may help destabilize hillsides and cause an increase in the frequency of landslide events.

Impact of Landslide on Claremont

Landslides are a serious geologic hazard in almost every state in America. Nationally, landslides cause 25 to 50 deaths each year. The best estimate of direct and indirect costs of landslide damage in the United States range between $1 and $2 billion annually.

Landslides affect utility services, transportation systems, and critical lifelines. The City may suffer immediate damages and loss of service. Disruptions of infrastructure, roads, and critical facilities could also have long-term effects. Utilities -- including potable water, wastewater, telecommunications, natural gas, and electric power -- are all essential to service City needs. Loss of electricity has the most widespread impact on other utilities and on the whole city. Natural gas pipes are also at risk of breakage from landslide movements as small as an inch or two.

Roads and Bridges

Losses incurred from landslide hazards in the City of Claremont are often associated with roads. The City of Claremont and County of Los Angeles are responsible for maintenance of public roads. They are tasked with responding to slides that inhibit the flow of traffic or are damaging a road or a bridge. The road departments do their best to communicate with residents and businesses impacted by landslides.

It is not cost-effective to mitigate all slides because of limited funds, and because some historical slides are likely to become active again even with mitigation measures. The City and County alleviate problem areas by grading slides, and by installing new drainage systems on the slopes to divert water from the landslides. This type of response activity is often the most cost-effective but is only temporary. Unfortunately, many property owners are unaware of slides and the dangers associated with them.

Lifelines and Critical Facilities

Lifelines and critical facilities should remain accessible, if possible, during a natural hazard event. The impact of closed transportation arteries are increased if the closed road or bridge is critical for hospitals and other emergency facilities. Losses of power and phone service are also potential consequences of landslide events. Due to heavy rains, soil erosion in hillside areas can be accelerated, resulting in loss of soil support beneath high voltage transmission towers in hillsides and remote areas. Flood events can also

cause landslides, which have serious impact on gas lines that are located in vulnerable soils.

Nonquantifiable Impacts

While a quantitative vulnerability assessment (an assessment that describes number of lives or amount of property exposed to the hazard) has not yet been conducted for landslide events impacting the City, there are many qualitative factors that point to potential vulnerability. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed

Summary of Claremont's Vulnerability to Earthquakes

Landslides and their impacts will vary by location and severity of any given landslide event and will likely only affect certain areas of the county during specific times. Landslides can impact major transportation arteries, blocking residents from essential services.

Factors included in assessing landslide risk include population and property distribution in the hazard area, the frequency of landslide or debris flow occurrences, slope steepness, soil characteristics, and precipitation intensity. Many landslides are difficult to mitigate, particularly in areas of large historic movement with weak underlying geologic materials. As communities continue to modify the terrain and influence natural processes, it is important to be aware of the physical properties of the underlying soils as they, along with climate, create landslide hazards. Even with proper planning, landslides continue to threaten the safety of people, property, and infrastructure, but without proper planning, landslide hazards are even more common and more destructive.

Although landslides are a natural occurrence, human impact can substantially affect the potential for landslide failures in the City of Claremont. Proper planning and geotechnical engineering will reduce the threat of safety of people, property, and infrastructure.

Hazard: Wildfire

Hazard Description

A wildfire is a fire that burns in largely undeveloped and natural areas. Wildfires spread by consuming flammable vegetation. This fire type often begins unnoticed, spreads quickly, and is usually signaled by dense smoke that may be visible from miles around. Wildfires can be caused by human activities (e.g., unattended burns, campfires, or off-road vehicles without spark arresting muffles) or by natural events such as lightning. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. Because of their distance from firefighting resources, they can be difficult to contain and can cause a great deal of destruction.

The potential for significant damage to life and property exists in areas designated as “wildland-urban interface areas,” where development is adjacent to densely vegetated areas. Certain conditions must be present for significant interface fires to occur. The most common conditions include: hot, dry and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started, several conditions influence its behavior, including fuel, topography, weather, drought, and development.

Fuel

Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is classified by volume and by type. Volume is described in terms of "fuel loading," or the amount of available vegetative fuel. Chaparral, a general term used to describe brushland, is a primary fuel of Southern California wildfires. Although chaparral is often considered as a single species, there are two distinct types: hard chaparral and soft chaparral. Within these two types are dozens of different plants, each with its own particular characteristics. The City of Claremont is composed of chaparral land, especially in the foothills.

An important element in understanding the danger of wildfire is the availability of diverse fuels in the landscape, such as natural vegetation, manmade structures and combustible materials. A house surrounded by brushy growth rather than cleared space allows for greater continuity of fuel and increases the fire’s ability to spread. After decades of fire suppression “dog-hair” thickets have accumulated, which enable high intensity fires to flare and spread rapidly.

Topography

Topography influences the movement of air, thereby directing a fire course. Gulches and canyons can funnel air and act as chimneys, which intensify fire behavior and cause the fire to spread faster. Solar heating of dry, south-facing slopes produces up slope drafts that can complicate fire behavior.

Weather

Weather patterns combined with certain geographic locations can create a favorable climate for wildfire activity. Areas where annual precipitation is less than 30 inches per year are extremely fire susceptible. High-risk areas in Southern California share a hot, dry season in late summer and early fall when high temperatures and low humidity favor fire activity. Santa Ana winds, which are heated by compression as they flow down to Southern California from Utah, create a particularly high risk, as they can rapidly spread what might otherwise be a small fire.

Drought

Recent concerns about the effects of climate change, particularly drought, are contributing to concerns about wildfire vulnerability. Unusually dry winters, or significantly less rainfall than normal, can lead to relatively drier conditions and leave reservoirs and water tables lower. Drought leads to problems with irrigation and contributes to additional fires, or increased difficulty in fighting fires.

Development

Growth and development in scrubland and forested areas is increasing the number of structures in Southern California interface areas. Wildfire affects development, yet development can also influence wildfire. Owners often prefer homes that are private with scenic views, nestled in vegetation, and use natural materials. A private setting is usually far from public roads, or hidden behind a narrow, curving driveway. These conditions, however, make evacuation and firefighting difficult.

Location and Extent

California experiences large, destructive wildland fires almost every year, and Los Angeles County is no exception. However, in recent years, the City of Claremont has lost neither structures nor life to wildfires.

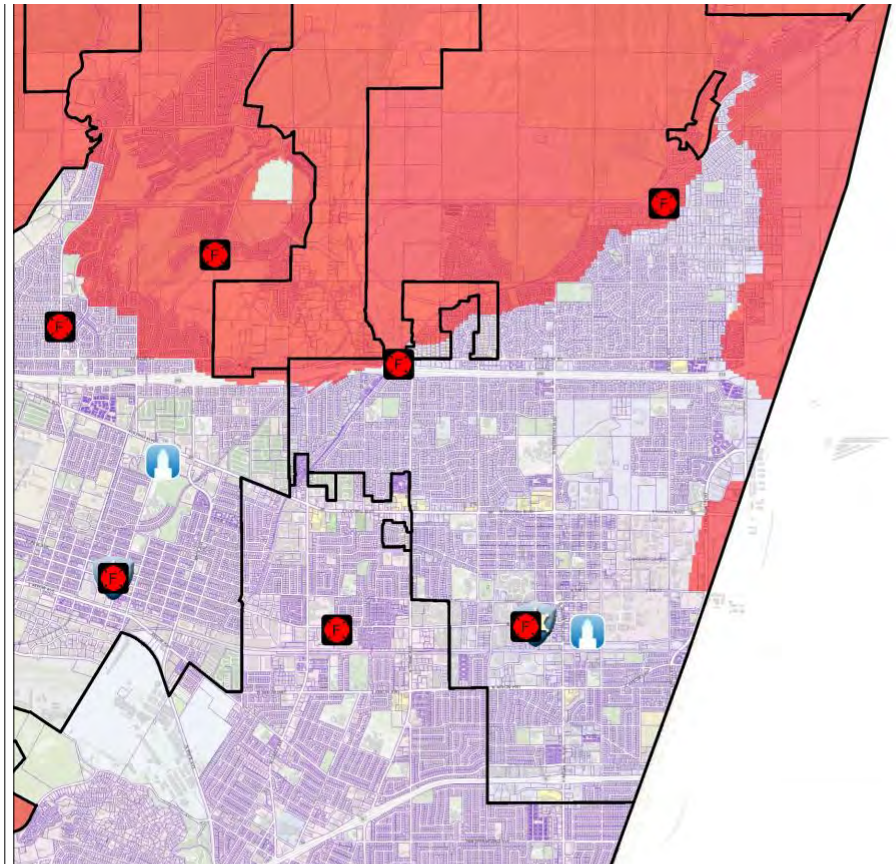
Southern California has two distinct areas of risk for wildland fire. The foothills and lower mountain areas are most often covered with scrub brush or chaparral. The higher elevations of mountains also have heavily forested terrain. The lower elevations covered with chaparral create one type of exposure.

One challenge Southern California faces regarding the wildfire hazard is from the increasing number of houses being built on the urban/wildland interface. Every year the growing population expands further into the hills and mountains, including forest lands. The increased "interface" between urban/suburban areas, and the open spaces created by this expansion, produces a significant increase in threats to life and property from fires, and pushes existing fire protection systems beyond original or current design and capability. Property owners in the interface are not aware of the problems and fire hazards or risks on their own property. Furthermore, human activities increase the incidence of fire ignition and potential damage.

Wildfires are not measured on a specific scale and are usually classified by size (e.g., acres burned) or impact (buildings destroyed or damaged, injuries or deaths, cost of damage, etc.). The risk of wildfire is classified on a three-tier scale of fire hazard severity zones (FHSZs): very high, high, and moderate. These classes do not correspond to a specific risk or intensity of fire but are qualitative terms that consider many factors. Fire-prone areas are also classified by the agency responsible for fire protection. Federal Responsibility Areas (FRAs) fall to federal agencies such as the US Forest Service, the Bureau of Land Management, and the National Park Service. State Responsibilities Areas (SRAs) fall to the California Department of Forestry and Fire Protection (CAL FIRE), and Local Responsibility Areas (LRAs) fall to local governments.

The combination of population density, terrain, weather, and residential and commercial development in the foothill area of Claremont presents a year-round threat of wildfires encroaching upon developed areas. Portions of the Claremont foothills are classic examples of the "chaparral-urban interface" where steadily increasing development meets or are incorporated into wild land areas, many of these bordering homes are in areas classified as Very High Fire Hazard Severity Zones (VHFHSZs). Additionally, parts of the Claremont Colleges community borders an area classified as VHFHSZ. Figure 14: Fire Hazard Severity Zones depicts the VHFHSZs mapped throughout Claremont.

Figure 14: Fire Hazard Severity Zones



Source: Los Angeles County GIS Viewer

Previous Occurrences

Previous Fires in Claremont

In 2002, the Williams Fire made its way from Azusa to La Verne burning 37,240 acres and destroying 76 structures. While it continued to burn from La Verne and cross into Claremont, it threatened the northern neighborhoods of Claremont such as Claraboya, Thompson Creek, and Padua Hills. Fortunately, the winds dissipated before causing property damage and threatening lives in Claremont.

In 2003, the massive Grand Prix fire, which ultimately combined with the Old Fire to form a 40-mile front across the San Gabriel Mountains, consumed almost 60,000 acres, and destroyed and/or damaged 71 homes in and around Claremont. Thousands of Claremont residents were forced to evacuate and seek temporary shelter elsewhere. The damage caused by the fire in the City of Claremont was estimated at $20 million.

The Station Fire impacted the City in 2009. Although there was no damage or impact to the City, costs included personnel responses in the form of mutual aide.

Historic Fires in Southern California

Large fires have been part of the Southern California landscape for decades.

- **2003 Southern California Fires**
  During the 2003 fire season, more than 6.9 million acres of public and private lands burned in the U.S., resulting in loss of property, damage to resources, and disruption of community services. Taxpayers spent more than $1.6 billion to combat more than 88,400 fires nationwide. Many of these fires burned in wildland/urban interface areas and exceeded the fire suppression capabilities of those areas.

  The fall of 2003 was a very destructive wildfire season in California. In a ten day period, 12 separate fires raged across Southern California in Los Angeles, Riverside, San Bernardino, San Diego and Ventura counties. The Grand Prix Fire started on October 21, 2003 and burned a total of 50,618 acres between Claremont and Lytle Creek. The fire destroyed 136 homes and was ruled “accidental but human-initiated.” The Simi Fire started on October 25, 2003 and burned a total of 107,570 acres between Simi Hills and southeastern Simi Valley, in eastern Ventura County and western Los Angeles County, California. It destroyed 37 homes and 278 buildings. The cause of the fire remains unknown.

- **2007 Southern California Fires**
  In late October 2007, Southern California experienced an unusually severe fire weather event characterized by intense, dry, gusty Santa Ana winds. This weather event drove a series of destructive wildfires that took a devastating toll on people, property, natural resources, and infrastructure. Although some fires burned into early November, the heaviest damage occurred during the first three days of the siege when the winds were the strongest.

During this siege, 17 people lost their lives, ten were killed by the fires outright, three were killed while evacuating, four died from other fire siege related causes, and 140 firefighters, and an unknown number of civilians were injured. A total of 3,069 homes and other buildings were destroyed, and hundreds more were damaged. Hundreds of thousands of people were evacuated at the height of the siege. The fires burned over half a million acres, including populated areas, wildlife habitat and watershed. Portions of the electrical power distribution network, telecommunications systems, and even some community water sources were destroyed. Transportation was disrupted over a large area for several days, including numerous road closures. Both the Governor of California and the President of the United States personally toured the ongoing fires. Governor Schwarzenegger proclaimed a state of emergency in seven counties before the end of the first day. President Bush quickly declared a major disaster. While the total impact of the 2007 fire siege was less than the disastrous fires of 2003, it was unquestionably one of the most devastating wildfire events in the history of California.

Recent Wildfires in California

The last five years have seen destructive and deadly fires across California. According to California Fire, seven[6] of the ten largest California wildfires have occurred over the past five years. The largest was the August Complex Fire (2020) that burned over one million acres across seven Northern California counties, destroyed 935 structures and resulted in one death. The Camp Fire (2018) in Butte destroyed over 18,000 structures and resulted in 85 deaths. The Woolsey Fire (2018) destroyed over 1,600 structures and resulted in three deaths in Ventura County.

Table 12: Recent Wildfires in California Costs

Year	2016	2017	2018	2019	2020
Number of Fires	6,959	9,270	7,948	7,148	7,335
Acres Burned	669,534	1,548,429	1,975,086	259,823	1,666,286
Fire Suppression Costs ($ million)	$534	$773	$890	$691 (EST)	$372 (EST)

Probability of Future Wildfire Events

The climate in Los Angeles County is characterized by warm, dry-summers and cool, sometimes wet winters. High moisture levels during the winter rainy season significantly increase the growth of plants. However, the vegetation is dried during the long, hot summers, decreasing plant moisture content and increasing the ratio of dead fuel to living

[6] https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf

fuel. As a result, fire susceptibility increases dramatically, particularly in late summer and early autumn.

Additionally, the Santa Ana winds contribute to the high incidence of wildfires in Los Angeles County. These winds originate during the autumn months in the hot, dry interior deserts to the north and east of Los Angeles County. They often sweep west into the county, bringing extremely dry air and high wind speeds that further desiccate plant communities during the period of the year when the constituent species have very low moisture content. The effect of these winds on existing fires is particularly dangerous; the winds can greatly increase the rate at which fires spread. Based on the conditions described above and the history of occurrence in the past, future events are very likely to occur. extent of future events will depend on specific conditions at the time of the fire.

Climate Change Considerations

Climate change is expected to cause an increase in temperatures, as well as more frequent and intense drought conditions. This will likely increase the amount of dry plant chaparral available for fuel, increasing the risk of wildfire statewide. Increases in fuel supplies could cause wildfires to move faster or spread into more-developed areas, which could increase the threat to Claremont.

Impact of Wildfire on Claremont

The primary effects of fire, such as loss of life, injury, destruction of buildings and wildlife, are well known. Fire also has a number of secondary effects, such as strained public utilities, depleted water supplies, downed power lines, disrupted telephone systems, and closed roads. In addition, flood control facilities are overtaxed by the increased flow from bare hillsides, and the resulting debris that washes down. Affected recreation areas may have to close or restrict operations. Moreover, buildings destroyed by fire are usually eligible for property tax reassessment, which reduces revenue to local government.

Fire destroys surface vegetation, leaving the soil bare and subject to erosion, when the rains begin in the fall and winter. Raindrops hit the surface with undiminished impact, splashing particles of soil loose that move downhill and are carried away by running water. Fire also destroys most of the roots that hold the soil in place, allowing running water to wash the soil away. Mudslides and mudflows can result from these processes.

In the event of a wildfire, vegetation, structures and other flammables can merge into unwieldy and unpredictable events. Factors important to the fighting of such fires include access, firebreaks, proximity of water sources, and proximity to a fire station, available firefighting personnel and equipment. Reviewing past wildland/urban interface fires shows that many structures are destroyed or damaged for one or more of the following reasons:

- Combustible roofing material
- Wood construction
- Structures with no defensible space

- Fire department has poor access to structures
- Subdivisions located in heavy natural fuel types
- Structures located on steep slopes covered with flammable vegetation
- Limited water supply
- Winds over 30 miles per hour

Road Access

Road access is a major issue for all emergency service providers. As development encroaches into the rural areas of the county, the number of houses without adequate turn-around space is increasing. In many areas, there is not adequate space for emergency vehicle turnarounds in single-family residential neighborhoods, obstructing emergency workers because they cannot access houses.

Large facilities (particularly schools and other facilities with vulnerable populations) located near the Wildland/Urban Interface must incorporate adequate evacuation planning into their Site Emergency Plans. Fire drills and fire evacuation routes should be pre-planned and practiced with transportation vehicles and shelter locations pre-planned.

Water Supply

Fire fighters in remote and rural areas are faced with limited water supply and lack of hydrant taps. Rural areas are characteristically outfitted with small diameter pipe water systems, inadequate for providing sustained fire fighting flows.

Interface Fire Education Programs and Enforcement

Fire protection in urban/wildland interface areas may rely heavily on the landowner's personal initiative to take measures to protect his or her own property. Therefore, public education and awareness plays a greater role in interface areas. In those areas with strict fire codes, property owners who resist maintaining the minimum brush clearances can be cited for failure to clear brush.

Need for Mitigation Programs

Continued development into the interface areas has growing impact on the wildland/urban interface. Wildfires will continue to present a substantial hazard to life and property in Southern California because many of its communities are built within or adjacent to hillsides and mountainous areas. The continued growth and development increases the public need for mitigation planning in Southern California.

Nonquantifiable Impacts

Impact that is not quantified, but can be anticipated in future events, includes:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community

- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed

Homeowner Risk Mitigation: Wildfire Hazard

The City has identified properties within Very High Fire Hazard Severity Zones as shown in Map: City of Claremont Fire Hazard Severity Zones. Defensible space can be created around structures by taking precautionary measures such as thinning trees and brush within a minimum of 30 feet of a home. Beyond 30 feet, remove dead wood, debris and low tree branches. Keep lawns trimmed, leaves raked, and the roof and rain-gutters free from debris such as dead limbs and leaves. Stack firewood at least 30 feet away from a home. Store flammable materials, liquids and solvents in metal containers outside the home at least 30 feet away from structures and wooden fences.

In Claremont, this scenario highlights the need for fire mitigation activity in all sectors of the region, wildland/urban interface or not. Examples of actions homeowners can take to mitigate fires include:

- Define a defensible space of a 30-foot non-combustible buffer area around the house
- Reduce flammable vegetation, trees and brush around the house
- Remove or prune trees
- Cut grass and weeds regularly
- Relocate wood piles and leftover materials
- Keep it clean
- Install fire resistant roofing materials and spark arrestors on chimneys

Summary of Claremont's Vulnerability to Wildfire

Wildfires are a natural part of the ecosystem in Southern California and present a substantial hazard to life and property in communities built within or adjacent to hillsides and mountainous areas. Fire potential is typically greatest in the months of August, September, and October, when dry vegetation, combined with offshore dry Santa Ana winds, create a high potential for spontaneous fires. The hillsides and steep slopes facilitate rapid fire spread. There is a huge potential for losses due to wildland/urban interface fires in Claremont.

In urban areas, the effectiveness of fire protection efforts is based upon several factors, including the age of structures, efficiency of circulation routes that ultimately affect response times and availability of water resources to combat fires. In wildland areas, taking the proper precautions, such as the use of fire resistant building materials, a pro-active Fire Prevention inspection program, and the development of defensible space around structures where combustible vegetation is controlled, can protect developed lands from fires and, therefore, reduce the potential loss of life and property.

Hazard: Windstorm

Hazard Description

A windstorm event in the region can range from short term microburst activity lasting only minutes to a long duration Santa Ana wind condition that lasts for several days. Tornados, like those that occur every year in the Midwest and Southeast parts of the United States, are a rare phenomenon in most of California, with most tornado-like activity coming from microbursts. Windstorms in the region can cause extensive damage to road and highway infrastructure and critical utility facilities.

Santa Ana Winds

Santa Ana winds are generally defined as warm, dry winds that blow from the east or northeast (offshore). Santa Ana Winds travel from the stable, high-pressure weather system called the Great Basin through the canyons and towards the low-pressure system off the Pacific. The City of Claremont is in the direct path of the ocean-bound Santa Ana winds.

Microbursts and Thunderstorm Wind Events

Microbursts are strong, damaging winds which strike the ground and often give the impression a tornado has struck. They frequently occur during intense thunderstorms. The origin of a microburst is downward moving air from a thunderstorm's core. But unlike a tornado, they affect only a rather small area.

Tornados

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. Tornados are often (but not always) visible as a funnel cloud. On a local-scale, tornados are the most intense of all atmospheric circulations and wind can reach destructive speeds of more than 300 mph. A tornado’s vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long

Location and Extent

The entire City is equally at risk for windstorm events.

Santa Ana Winds

Santa Ana winds commonly occur between October and February, with December having the highest frequency of events. Summer events are rare. Wind speeds are typically north to east at 35 knots through and below passes, and canyons with gusts to 50 knots. Stronger Santa Ana winds has gusts greater than 60 knots over widespread areas, and gusts greater than 100 knots in favored areas. Frequently, the strongest winds in the basin occur during the night and morning hours due to the absence of a sea breeze. The sea breeze which typically blows onshore daily, can moderate the Santa Ana winds during the late morning and afternoon hours. Santa Ana winds are an important forecast challenge because of the high fire danger associated with them.

These winds occur below the passes and canyons of the coastal ranges of Southern California and in the Los Angeles and Orange County basins. Santa Ana winds often blow with exceptional speed in the Santa Ana Canyon (the canyon from which it derives its name). Forecasters at the National Weather Service offices in Oxnard and San Diego usually place speed minimums on these winds and reserve the use of "Santa Ana" for winds greater than 25 knots. These winds accelerate to speeds of 35 knots as they move through canyons and passes, with gusts to 50 or even 60 knots.

Microbursts

A microburst is a type of surface wind in excess of 39 mph caused by a small-scale, strong downdraft from the base of convective thundershowers and thunderstorms. Microbursts are confined to less than 2.5 miles in diameter from the initial point of downdraft impact. An intense microburst can result in damaging winds near 170 mph and often last for less than five minutes.

Tornados

In order to measure the intensity and wind strength of a tornado, Dr. T. Theodore Fujita developed the Fujita Tornado Damage Scale (F-scale). This scale compares the estimated wind velocity with the corresponding amount of suspected damage. The scale measures six classifications of tornados with increasing magnitude from an “F0” tornado to a “F6+” tornado. An updated F-scale was implemented by the NOAA in 2007 and is called the Enhanced F-scale (EF-scale). In Los Angeles County, tornados are extremely rare with 44 Tornado events since 1950, five of which were F2 events and 9 of which were F1.

Table 13: Fujita and Enhanced F-Scale

F SCALE			Operational EF-SCALE	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85
1	73-112	79-117	1	86-110
2	113-157	118-161	2	111-135
3	158-207	162-209	3	136-165
4	208-260	210-261	4	166-200
5	261-318	262-317	5	Over 200

Source: NOAA https://www.spc.noaa.gov/efscale/ef-scale.html

Previous Occurrences

Los Angeles County has experienced both high wind and thunderstorm wind events. The strongest winds are Santa Ana winds in winter. As an example of the impacts from high winds, a windstorm on November 30, 2011, left 300,000 residents without power, some for over one week. The NOAA National Centers for Environmental Information (NCEI) storm events database lists the following wind events from 1990 to 2020:

- 208 high wind events, with one death reported.
- 30 thunderstorm wind events, with one death and two injuries reported.
- 18 tornados from 1990 through 2020, with one reported injury. The recorded tornado events are rated as F0 (13 events), EF0 (two events), F1 (three events).

Following is an overview of major wind events to hit the City and surrounding areas over the past 30 years:

Date	Location and Damage
March 3, 1992	A small tornado with winds to 100 mph, struck a one block strip of the El Sereno district of Los Angeles. Shredding roofs, shattering windows, downing an oak tree and toppling a billboard onto a car. About 10 houses were damaged.
June 16, 1995	A severe thunderstorm spawned a tornado that briefly touched down on the 14800 block of Dalman Street in Whittier. Witnesses said it tore through a chain link gate, swirled rubbish cans in the air, and snapped off ten-foot long tree branches. A rain gutter was also torn from a house.
February 16, 2000	A cold and unstable airmass generated heavy showers and thunderstorms across Central and Southern California. Numerous reports of heavy showers and small hail were received from the area. In Covina, a weak tornado developed, damaging four mobile homes. Fortunately, no one was injured. With the heavy showers, street flooding was reported in Monrovia.
December 12, 2001	In the community of Walnut, a weak tornado touched down in the early morning hours. Several homes sustained minor roof damage and about 30 trees were knocked down. No injuries were reported.
November 27, 2004	In the Antelope Valley, strong winds gusting to 50 mph knocked down a tree onto a vehicle traveling along Avenue K in the city of Lancaster. A six foot branch smashed through the windshield, instantly killing the female driver. A 16 year-old passenger sustained moderate injuries.
October 26, 2020	Claremont experienced a significant windstorm which resulted in power outages, downed branches and limbs, and the loss of 20 full-size City trees.

Probability of Future Events

While high impact wind incidents are not frequent in the area, significant wind events and sporadic tornado activity have been known to negatively impact the region. Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region which can be adversely impacted during a windstorm event.

Climate Change Considerations

According to the Fourth National Climate Assessment published in 2018[7], it is uncertain as to whether climate change has an impact on the frequency or severity of severe whether such as tornadoes or windstorms.

Impact of Windstorm on Claremont

Windstorms and tornadoes can significantly impact life and property, utilities, infrastructure, transportation and result in an increased fire threat.

Santa Ana wind conditions can lead to fire fanned by the high winds. Wind driven flames caused the destruction of more than 3,000 homes in Southern California in October 2003. Other forms of disaster include direct building damage, damage to utilities and infrastructure as a result of the high winds. This has occurred in the past few years in many Southland communities including Los Angeles County.

Life and Property

City of Claremont emergency response personnel would be involved if there is a wide-ranging windstorm or microburst tornadic activity. Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure creates a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents creates lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail causing considerable damage.

Debris carried along by extreme winds can directly contribute to loss of life and indirectly to the failure of protective building envelopes, siding, or walls. When severe windstorms strike a city, downed trees, power lines, and damaged property can be major hindrances to emergency response and disaster recovery.

Utilities

Historically, falling trees are the major cause of power outages in the region. Windstorms such as strong microbursts and Santa Ana wind conditions cause flying debris and downed utility lines. For example, tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, overhead power lines are damaged, even in relatively minor

[7] https://nca2018.globalchange.gov/chapter/2/

windstorm events. Falling trees bring electric power lines down to the pavement, creating the possibility of lethal electric shock.

Infrastructure

Windstorms damage buildings, power lines, and other property, and infrastructure, due to falling trees and branches. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds.

Transportation

Windstorm activity impacts local transportation in addition to the problems caused by downed trees and electrical wires blocking streets and highways. During periods of extremely strong Santa Ana winds, major highways can be temporarily closed to truck and recreational vehicle traffic. However, typically these disruptions are not long lasting, nor do they carry a severe long term economic impact on the region.

Increased Fire Threat

Perhaps the greatest danger from windstorm activity in Southern California comes from the combination of the Santa Ana winds with the major fires that occur every few years in the urban/wildland interface. With the Santa Ana winds driving the flames, the speed and reach of the flames is even greater than in times of calm wind conditions.

Nonquantifiable Impacts

Impact that is not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Summary of Claremont's Vulnerability to Windstorms

Severe windstorms pose a significant risk to life and property in Claremont by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause tornado-like damage to local homes and businesses in and near Claremont. High winds have the potential for a destructive impact, especially to trees, power lines, and utility services.

Section 5: Mitigation Strategy

Overview of Mitigation Strategy

The City of Claremont's Mitigation Strategy is derived from an in-depth review of the revised hazards, vulnerabilities and capabilities sections of this Plan, coupled with the Planning Team's vision for creating a disaster resilient and sustainable community.

The City of Claremont recognizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation Plans assist communities in reducing risk from natural hazards and certain human caused hazards by identifying resources, information and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City. The Plan provides a set of action items to reduce risk from hazards.

The resources and information within the Mitigation Plan:

- Establish a basis for coordination and collaboration among agencies and the public in the City of Claremont
- Identify and prioritize future mitigation projects
- Assist in meeting the requirements of federal assistance programs

Current Mitigation Programs

The City intends to incorporate mitigation planning into many aspects of its daily operations. The Planning Team will work to integrate mitigation strategies into the general operations of the City and partner organizations.

This Plan works in concert with the City of Claremont General Plan, particularly the Safety Element, which is being updated concurrently (2021) to the development of this plan. The Safety Element creates a framework for mitigation and preparation activities and integrates with the goals of this Plan. The LHMP is an opportunity for the City to expand on the goals and policies in the General Plan, identifying specific mitigation actions to achieve the general plan's high-level objectives. The General Plan and the LHMP collectively help to reduce the threat from hazardous conditions to Claremont residents, businesses, visitors, buildings and facilities, infrastructure, key services, ecosystems, and other assets. This plan is also integrated with other City plans including the City of Claremont Emergency Operations Plan and the Capital Improvement Plan, as well as department specific standard operating procedures.

Table 14: Existing Processes and Programs identifies existing planning and regulatory, administrative and technical, financial, and education and outreach capabilities through which the plan could be implemented. While at this time there is limited money and resources to expand on these capabilities, several opportunities to expand the existing capabilities have been identified.

Table 14: Existing Processes and Programs

Process	Action	Implementation of Plan
Administrative and Technical	Departmental or organizational work plans, policies, and procedural changes	• City Manager's Office • Planning Department • Community Development Department • Public Works Department • Other departments as appropriate
Administrative and Technical	Other plans	• Reference plan in Emergency Operations Plan • Address plan findings and incorporate mitigation activities in General Plan Opportunity for Expansion: • Consider expanding cyber security expertise, including possibly bringing in a consultant
Education and Outreach	Creative funding and initiatives	• Community volunteers • In-kind resources • Public-private partnerships • State support Opportunities for Expansion: • Integrate further with Sustainability Committee • Expand emergency preparedness awareness and knowledge through neighborhood education and CERT classes.
Education and Outreach	Advisory bodies and committees	• Disaster Council (city and county) • Emergency Management Ad Hoc Committee • Inter-Agency Coordination Group • Safety Committee
Financial	Capital and operational budgets	• Include line-item mitigation measures in budget as appropriate
Financial	Traditional and nontraditional sources	• Once plan is approved, seek authority to use bonds, fees, loans, and taxes to finance projects • Seek assistance from federal and state government, foundation, nonprofit, and private sources, such as Hazard Mitigation Grant Program

Process	Action	Implementation of Plan
		Opportunities for Expansion: • Research new grant opportunities through U.S. Department of Housing and Urban Development, Community Development Block Grant. • Pursue state surplus funding opportunities
Planning and Regulatory	Executive orders, ordinances, and other directives	• Building Code • Comprehensive Planning (Institutionalize hazard mitigation in land use and new construction) • National Flood Insurance Program • Storm Water Management Plan • Zoning Ordinance Opportunity for Expansion • Require hazard mitigation in design of new construction in the Capital Improvement Plan • Review and update Zoning Ordinance • Implement new plans that are developed and shared by other state, local and federal agencies

City of Claremont General Plan

The Planning Team went to great lengths to examine the various regulatory documents influencing the City's ability to mitigate against the identified hazards. Perhaps, the most important of those documents was the City's General Plan, last updated in 2009 and currently being updated by the City. It is the intention of the Planning Team to link the Mitigation Plan actions items as closely as possible to the City's General Plan. The purpose of this association is that many development projects require a determination of "General Plan conformity" prior to approval. If the Mitigation Plan and General Plan are aligned, this will better ensure both the sustainability and implementation of the Mitigation Plan. Since the establishment of the DMA 2000 regulations, FEMA and other regulators have been frustrated by the ineffectiveness of mitigation plan implementation – in other words, the failure of plans to actually affect the built environment and cause a reduction in risk. The Planning Team believes that changing the circle of build-damage-rebuild can most effectively be broken by linking the Mitigation Plan to the regulations and policy guidelines that allow for construction and land use.

Following is a list of mitigation policies drawn from the 2009 General Plan.

Table 15: General Plan Policies

GENERAL PLAN POLICIES (Note: Each of the policies includes a brief explanation as to applicability to the Local Hazard Mitigation Plan)	MITIGATION PLAN GOALS				
	Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
SAFETY ELEMENT					
Goal: 6-2 Minimize the risk of injury, loss of life, and damage to property resulting from natural and human-caused disasters and conditions. **Policies:** 6-2.1 Practice proactive planning and development approaches that require developers to identify potential hazards that might affect a development and mitigate the potential hazards as needed to the satisfaction of the City. 6-2.2 Enforce Uniform Building Code standards for grading. 6-2.3 Review and explore disaster preparedness and emergency response capabilities on a regular basis. 6-2.4 Cooperate with and coordinate emergency preparedness and response programs with jurisdictions, agencies, and organizations such as surrounding cities, The Claremont Colleges, the Claremont School District, and the Los Angeles County Fire Department. 6-2.5 Continue and expand public educational programs to include all aspects of public safety. 6-2.6 Maintain a list of public buildings that could support emergency functions in the event of a disaster. 6-2.7 Require that development of major facilities and high-occupancy buildings in the hazardous zone submit design analysis, soils, geologic, and seismic reports to the City to indicate that an undue hazard does not exist or would not result from construction on the property. 6-2.8 Continually review the City's disaster communication system, and update/modify as needed. 6-2.9 Continue to implement the City's hillside plan to reduce harm to future residents at the urban interface.	X	X	X	X	X

GENERAL PLAN POLICIES (Note: Each of the policies includes a brief explanation as to applicability to the Local Hazard Mitigation Plan)	MITIGATION PLAN GOALS				
	Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
6-2.10 Restrict vehicular and recreational use of the undeveloped foothill areas during critically hazardous periods.					
Goal: 6-4 Minimize risks to public safety from seismic events. **Policies:** 6-4.1 Enforce the most recent building codes governing seismic safety and structural design to minimize damage from earthquakes. 6-4.2 Continue to support efforts to identify location, potential activity, and dangers associated with faults under investigation, and implement recommendations (setbacks, foundation/building design methods, etc.) contained in geotechnical reports.	X	X	X	X	X
Goal: 6-5 Minimize risks to public safety from geologic events. **Policies:** 6-5.1 Require geotechnical evaluation and recommendations prior to new development, as appropriate. Such geotechnical evaluation shall analyze the potential hazards from: Landslides, Liquefaction, Expansive soils, Mud and debris flow Recommendations shall include mitigation to avoid or minimize the identified hazards.	X	X	X	X	X
Goal: 6-6 Minimize the risks associated with storm flooding and dam inundation. **Policies:** 6-6.1 Work with the U.S. Army Corps of Engineers and Los Angeles County to ensure dam structures are upgraded as	X	X	X	X	X

GENERAL PLAN POLICIES (Note: Each of the policies includes a brief explanation as to applicability to the Local Hazard Mitigation Plan)	MITIGATION PLAN GOALS				
	Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
needed to withstand earthquakes and prevent inundation of downstream areas. 6-6.2 Work with the U.S. Army Corps of Engineers and Los Angeles County to encourage regular maintenance and monitoring of flood-control facilities. 6-6.3 Complete the Chicken Creek flood control measures, and transfer operations and management to Los Angeles County.					
Goal: 6-7 Minimize the risks associated with urban and wildland fires. **Policies:** 6-7.1 Work with the Fire Department to establish minimum standards for water supply and access for fire-fighting equipment. 6.7-2 Work with Fire Department to enforce restrictions on vehicular and recreational use of foothill areas during critically hazardous periods. 6-7.3 Enforce building fire codes and ordinances, and continue to research and adopt best practices pertaining to fire management and fire hazards. 6-7.4 Work with the Fire Department to establish an aggressive fire inspection and code enforcement program. 6-7.5 Continue to disseminate information relating to fire prevention measures and resident response to emergency situations, with the understanding that an informed public can greatly aid in the reduction of fire loss. 6-7.6 Continue to work with Los Angeles County Weed Abatement Division to implement and enforce the county's systematic weed abatement program.	X	X	X	X	X

GENERAL PLAN POLICIES (Note: Each of the policies includes a brief explanation as to applicability to the Local Hazard Mitigation Plan)	MITIGATION PLAN GOALS				
	Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
Goal: 6-8 Minimize the improper storage and dumping of hazardous waste materials. **Policies:** 6-8.1 Educate residents regarding the types of household hazardous waste and proper manners of disposal, and continue to have yearly hazardous waste round-ups. 6-8.2 Utilize the Los Angeles County Hazardous Waste Management Plan as a guide to future hazardous waste management planning efforts. 6-8.3 Continue to require that all proposals for businesses involved in hazardous materials use, storage, or transport areas submit a hazards safety plan to appropriate City agencies, and the County Fire Department for review of potential hazards. 6-8.4 Inform residents about the dangers of improper disposal of hazardous materials.	X	X	X	X	X
Goal: 6-9 Provide effective and comprehensive policing services and enforce laws in an equitable way. **Policies:** 6-9.1 Provide a state-of-the-art Police Station and up-to-date emergency communications technology for the Claremont Police Department. 6-9.2 Continue to encourage design concepts that inhibit criminal behaviors. 6-9.3 Provide timely responses to emergency and non-emergency calls for service 24 hours a day. 6-9.4 Strive for the smooth and efficient movement of traffic throughout the community. 6-9.5 Recruit, hire, and train personnel to provide public service in an unbiased manner. 6-9.6 Continue to develop and implement community oriented Policing Project to foster accountability, mutual	X	X	X	X	X

GENERAL PLAN POLICIES (Note: Each of the policies includes a brief explanation as to applicability to the Local Hazard Mitigation Plan)	MITIGATION PLAN GOALS				
	Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
trust, and respect between the community and the Police Department. 6-9.7 Assign personnel and resources, such that each police patrol unit can maintain 30 to 35 percent "free patrol" time to provide preventative crime patrol, proactive traffic enforcement and regulation, and community-oriented public safety service. 6-9.8 Initiate proactive crime suppression and prevention strategies throughout the community. 6-9.9 Provide additional, cost-effective public safety services through the utilization of volunteers in our Police Reserve Officer, Community Patrol Volunteer Program, Explorer Program, Traumatic Intervention Service, Chaplain Volunteer Program, and Community Emergency Response Team (CERT). 6-9.10 Participate in school liaison activities such as Healthy Start Collaborative Program (School Resource Officer), on-campus probation officer, Drug Abuse Resistance Education (D.A.R.E.), Adopt-a-Cop, Red Ribbon Week, School Attendance Review Board (SARB), and other joint police/school district projects that may be developed in the future. 6-9.11 Participate in community outreach activities such as Neighborhood Watch, Business Crime Watch, security surveys, crime prevention presentations, Cubs for Kids, Designated Driver, Bike Safety Rodeos, CERT, Citizen's Academy, and other activities that may be developed in the future. 6-9.12 Continue to monitor gang activities in the community, and work with surrounding jurisdictions and outside groups and organizations to prevent criminal activities and gang violence.					
Goal: 6-10 Strive to maintain the highest level of emergency preparedness for natural and human-caused disasters and threats.	X	X	X	X	X

GENERAL PLAN POLICIES (Note: Each of the policies includes a brief explanation as to applicability to the Local Hazard Mitigation Plan)	MITIGATION PLAN GOALS				
	Protect Life and Property	Public Awareness	Natural Systems	Partnerships and Implementation	Emergency Services
Policies: 6-10.1 Educate residents of hazards and threats addressed in the Claremont Emergency Plan/SEMS Multi-hazard Functional Plan and the Natural Hazard Mitigation Basic Plan, and use these plans as a guide to prevention and mitigation of natural and human-caused hazards. 6-10.2 Educate City staff to follow established procedures and responsibilities stated in the Emergency Plan/SEMS Multi-hazard Functional Plan and the Natural Hazard Mitigation Basic Plan in the event of an emergency. 6-10.3 Complete implementation of a reverse 911 system to facilitate evacuation in case of an emergency. 6-10.4 Respond to emergency calls for service within an average of less than four minutes. 6-10.5 Work to ensure the adequacy of disaster response and coordination of all segments and populations in the community. 6-10.6 Continue to have a paramedic squad assigned within Claremont boundaries.					

National Flood Insurance Program

The City of Claremont participates in the National Flood Insurance Program (NFIP). Established by Congress in 1968, the NFIP provides federally-backed flood insurance to homeowners, renters, and businesses in communities that adopt and enforce floodplain management ordinances to reduce future flood damage. The City of Claremont adopted a floodplain management ordinance and has Flood Insurance Rate Maps (FIRM) that show floodways, 100-year flood zones, and 500-year flood zones. The FEMA FIRM maps for the City of Claremont were last updated September 26, 2008 (See *Flooding Hazard Analysis).*

The City has been designated as NSFHA (No Special Flood Hazard Area). As of the end of April 2021[8], there were 38 properties in Claremont insured under NFIP, with a total insured value of approximately $11.4 million. Since the start of the program, there have been 5 claims reported within Claremont with a total amount of payments issued totally $6,485.

Goals

The Planning Team reviewed and validated the mitigation goals established in the prior plan. Based on current hazard profiles and knowledge of existing vulnerabilities and capabilities, appropriate revisions were made to the goals and relevant action items. The goals are based on the risk assessment and represent a long-term vision for hazard reduction or enhanced mitigation capabilities. They are compatible with community needs and goals expressed in other planning documents prepared by the City.

Each goal is supported by mitigation action items. The Planning Team developed these action items through its knowledge of the local area, risk assessment, review of past efforts, identification of mitigation activities, and qualitative analysis.

The five mitigation goals are as follows:

1. **Protect Life and Property**
   - Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural, human-caused, and technological hazards.

   - Improve hazard assessment information to make recommendations for avoiding new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural, human-caused, and technological hazards.

2. **Enhance Public Awareness**
   - Develop and implement education and outreach programs to increase public awareness of the risks associated with natural, human-caused, and technological hazards.

   - Provide information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities.

3. **Preserve Natural Systems**
   - Support management and land use planning practices with hazard mitigation to protect life.

[8] NFIP Policy and Loss Data by Geography (HUDEX) as of 4/30/21 Accessed: https://nfipservices.floodsmart.gov/reports-flood-insurance-data

- Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions.

4. **Encourage Partnerships and Implementation**
   - Strengthen communication and coordinate participation with public agencies, citizens, non-profit organizations, business, and industry to support implementation.

   - Encourage leadership within the City and public organizations to prioritize and implement local and regional hazard mitigation activities.

5. **Strengthen Emergency Services**
   - Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.

   - Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.

   - Coordinate and integrate hazard mitigation activities where appropriate, with emergency operations plans and procedures.

Mitigation Action Items

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the timeline for implementation.

The action items are organized within the following Mitigation Actions Matrix, which lists all of the multi-hazard (actions that reduce risks for more than one specific hazard) and hazard-specific action items included in the mitigation plan. Data collection and research and the public participation process resulted in the development of these action items (**Section 3: Planning Process**).

To address these hazards, the Planning Team identified 30 mitigation projects across the following categories:

- Multi-Hazard (MH)
- Fire (FR)
- Earthquake (EQ)
- Severe Weather – includes Windstorm (SW)
- Flood (FLD)
- Landslide (LND)
- Cyber (CYB)

While the Planning Team identified drought as a hazard, there were no specific mitigation action items were identified as it was the lowest priority hazard and resources are limited.

The City will continue to evaluate this hazard during the annual review of the LHMP and will consider adding mitigation action items as they are identified.

The Mitigation Actions Matrix includes the following information for each action item:

Funding Source

The action items can be funded through a variety of sources, possibly including operating budget/general fund, development fees, Community Development Block Grant (CDBG), other Grants, private funding, Capital Improvement Plan, and other funding opportunities.

Potential FEMA Grant Funding Sources include:

Hazard Mitigation Grant Program (HMGP): FEMA's Hazard Mitigation Grant Program provides funding to state, local, tribal and territorial governments so they can rebuild in a way that reduces, or mitigates, future disaster losses in their communities. This grant funding is available after a presidentially declared disaster.

Flood Mitigation Assistance (FMA): The Flood Mitigation Assistance Program is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.

Building Resilient Infrastructure and Communities (BRIC): Building Resilient Infrastructure and Communities will support states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.

Coordinating Organization

The Mitigation Actions Matrix assigns primary responsibility for each of the action items. The hierarchies of the assignments vary – some are positions, others departments, and other committees. The primary responsibility for implementing the action items falls to the entity shown as the "Coordinating Organization." The coordinating organization is the agency with regulatory responsibility to address hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, county, or regional agencies that are capable of or responsible for implementing activities and programs.

Plan Goals Addressed

The Plan goals addressed by each action item are included to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins.

The Plan goals are organized into the following five areas:

- ✓ Protect Life and Property

- ✓ Enhance Public Awareness
- ✓ Preserve Natural Systems
- ✓ Encourage Partnerships and Implementation
- ✓ Strengthen Emergency Services

Economic Analysis of Mitigation Projects

FEMA's approach to identify the costs and benefits associated with hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis.

Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating hazards can provide decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

For federal funded projects, the Planning Team will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Planning Team will use other approaches to understand the costs and benefits of each action item and develop a prioritized list.

Ranking Priorities

To assist with implementing the Hazard Mitigation Plan the Planning Team adopted the following process for ranking mitigation action items. Designations of “High”, “Medium”, and “Low” priority have been assigned to each action item using the following criteria:

Does the Action:

- solve the problem?
- address Vulnerability Assessment?
- reduce the exposure or vulnerability to the highest priority hazard?
- address multiple hazards?
- benefits equal or exceed costs?
- implement a goal, policy, or project identified in the General Plan or Capital Improvement Plan?

Can the Action:

- be implemented with existing funds?
- be implemented by existing state or federal grant programs?
- be completed within the 5-year life cycle of the LHMP?
- be implemented with currently available technologies?

Will the Action:

- be accepted by the community?
- be supported by community leaders?
- adversely impact segments of the population or neighborhoods?
- require a change in local ordinances or zoning laws?
- positive or neutral impact on the environment?
- comply with all local, state and federal environmental laws and regulations?

Is there:

- sufficient staffing to undertake the project?
- existing authority to undertake the project?

Answers to the criteria above determined the priority according to the following scale:

Priority Ranking	Scale
Low Priority	1-6
Medium Priority	7-12
High Priority	13-18

The Planning Team met to review the prioritization of current projects as well as the prioritization of new mitigation projects that were added. The Planning Team reviewed the criteria and affirmed the prioritization of ongoing or delayed projects and ranked new projects accordingly.

Mitigation Actions Matrix

Following is Table 16: Mitigation Actions Matrix which identifies the existing and future mitigation activities developed by the Planning Team.

Table 16: Mitigation Actions Matrix

Action Item	Accomplishments (+) and Ideas for Implementation (-)	Responsible Entity	Timeframe	Funding Source (GF=General Fund, GR=Grant, Other as Noted)	Ranking (H=High, M=Medium, L=Low)
Multi-Hazard Action Items					
MH-1 Emergency Training	+ Continue to conduct training and coordinate mock emergency exercises so that emergency responders are prepared.	Police Department - Emergency Services Coordinator	Ongoing	GF	H
MH-2 Community Outreach	+ Provide information regarding local hazards and steps residents can take to be prepared: • Claremont CERT • City Website • Social Media and other publications	Police Department- Emergency Services Coordinator, Local Chapter American Red Cross, Fire Department	Ongoing	GF	H
MH-3 Alerts and Warning	+ Continue to use Everbridge for emergency notifications. + Continue to use social media to disseminate hazards and information regarding emergency situations.	Police Department	Ongoing	GF, GR	H
MH-4 Zoning and General Plan	- Review land use designations for identified hazard areas in order to minimize development density in disaster-prone areas while recognizing the private	Community Development Department - Planning Division through the	Ongoing	GF	H

	property owner's rights. The only mapped areas presently are for liquefaction.	General Plan update process			
MH-5 Backup Power	+ Continue to maintain emergency electrical backup for City facilities.	Community Services Department	Ongoing	GF	H
MH-6 New Backup Power	- Provide emergency electrical backup to Joslyn Center.	Police Department	5 years	GR, FEMA BRIC	H
MH-7 Amend Building and Fire Codes	+ Amend building and fire codes for commercial and residential buildings to align with revisions from the California Building Codes or other mandatory guidance.	Community Development Department - Building Division	Ongoing	GF	H
MH-8 Development Review	+ Design roads with sufficient width and number of access points to facilitate the safe egress from disaster-prone areas in an expeditious fashion while allowing emergency personnel clear access into the disaster area	Community Development Department - Engineering and Planning Divisions, County of Los Angeles Public Works, Los Angeles County Fire, other Partnering Agencies	Ongoing	GF, GR FEMA BRIC	H
MH-9 Capital Improvement Plan	+ Continue to consider means to minimize the impacts from hazards when updating the CIP, including:	Community Services Department, Community	Ongoing	GF	H

	• Development/extension of roads and other critical infrastructure into disaster-prone areas in a manner that reduces vulnerability. • Upgrading the sizes of culverts or installation of new drainage structures to eliminate the ponding of water on roads • Other means of minimizing impacts of hazards	Development Department			
MH-10 American Red Cross Shelter Readiness Program	+ Participate in the American Red Cross Shelter Readiness Program • Establish a Facility Use Agreement	Police Department	1 Year	GF	H
MH-11 Resiliency Project	- Implement solar power with battery backup to help with resiliency at several City facilities including Hughes Center, City Yard, Police Department and Taylor Hall (Part of Trane Energy Improvement Project).	Community Services Department	2 Years	Other: Cash flow neutral project funded by repayable loans that will be offset and paid for by energy, operations, and maintenance savings	H
Fire Action Items					

FR-1 Fire Mitigation and Community Preparedness Outreach	+ Continue to update the Community about fire mitigation efforts on the City website, social media, weekly updates, and a quarterly newsletter in order to: • Encourage property owners in the Urban Interface area to conduct brush clearance in accordance with Los Angeles County Fire Department Standards. The Los Angeles County Fire Department will conduct brush inspections during the fire season in addition to inspecting hydrants and helicopter spots. • Encourage homeowners to have their chimneys inspected and cleaned. • Encourage property owners in the Urban Interface areas to remove cumulative debris that could contribute to the spread of wildfires. • Encourage residents to change the batteries regularly in their smoke detectors. In addition, have an operable fire home fire extinguisher.	Administrative Services/ Public Information Officer, Los Angeles County Fire Department	Ongoing	GF	H

	• Educate residents regarding the proper evacuation procedures by encouraging them to develop an evacuation plans and practice emergency drills.				
FR-2 Fire Extinguisher Training	+ Offer fire extinguisher training for City personnel; training is scheduled annually with fire equipment recharging.	Police Department-Emergency Services Coordinator, CERT	Ongoing	GF	H
FR-3 General Water Infrastructure	- Install water infrastructure improvements in support of fire flows in the Claraboya area	Golden State Water	3 years	Private Enterprise Funds	H
FR-4 Tree Removal	- As a fire prevention measure, remove the Eucalyptus trees in Sycamore Canyon.	Community Services Department	5 years	GR	M
FR-5 Brush Clearance	+ Every May the Fire Department notifies brush clearance directives to private property owners.	Los Angeles County Fire Department	Annually	GF	L
FR-6 Brush Clearance	- Fund brush clearing project for City-owned properties.	Community Services	Annually	GF, GR	H
Earthquake Action Items					
EQ-1 Hillside Ordinance	+ Continue to implement existing hillside ordinance that clusters development and creates open space. When homes are developed in accordance with the City's hillside ordinance, care will be taken in the siting of the home to	Community Development Department - Planning Division	Ongoing	GF	L

	be setback from the slopes outside of the "convection cone" of intense heat. The City will work with the local Fire authority in determining the appropriate placement of homes.				
EQ-2 Grading Plans	+ Continue to require grading plans and geotechnical reports for development	Community Development Department - Engineering Division	Ongoing	GF	L
EQ-3 Police Station	- Identify funding to perform seismic and safety retrofits to the Police Station and/or identify funding to replace the existing facility.	Police Department	5 years	GF	H
Severe Weather Action Items					
SW-1 Street Tree Management	+ Continue to regularly prune trees and inspect for disease in accordance with the City's established tree maintenance policies	Community Services Department	Ongoing	GF, Landscape and Lighting District (LLD) for Tree Maintenance	H
SW-2 Underground Utilities	+ Continue to require the undergrounding of utilities with new construction. Also, explore funding programs/methods to underground existing overhead utility lines throughout the City	Community Development Department	Ongoing	GF, GR FEMA BRIC	H
SW-3 Retrofit A/C Units	- Retrofit air conditioning units in City facilities to be compatible with emergency backup generators.	Community Services Department	3 years	Repayable loans that would be offset and	H

				paid for by energy, operations and maintenance savings	
Flood Action Items					
FLD-1 Drainage System maintenance	+ Review and maintain local drainage facilities to ensure adequate carrying capacity during times of storms	Community Services Department, Community Development Department – Engineering, Los Angeles County Department of Public Works	Ongoing	GF, GR FEMA FMA	H
FLD-2 Flood insurance	+ Encourage local homeowners to purchase flood insurance as needed + Inform FEMA as modifications/ upgrades are made to our municipal storm drain system	Community Development Department - Engineering Division	Ongoing	GF	H
FLD-3 On-site Drainage facilities	+ Continue to implement the requirements of the National Pollutant Discharge Elimination System municipal permit for new development, including retention of the first ¾" rainfall as required (1 acre and above)	Community Development Department - Engineering Division	Ongoing	GF	H
Landslide Action Items					

LND-1 Debris clearance	+ Continue to clear debris to ensure efficient functioning of drainage system.	Community Services	Ongoing	GF	H
Cyber Action Items					
CYB-1 Cyber Security Training	- Ensure training protocols reflect current and industry best practices in the fields of cyber, information, and critical infrastructure security. Where necessary or applicable, integrate cyber-security training in staff's professional annual training/development goals and/or performance reviews.	Administrative Services	1-2 years	GF	H
CYB-2 Employee Training	- Establish and conduct annual employee training on privacy and security policies and incident response procedures	Administrative Services/ Information Technology	1-2 years	GF	H
CYB-3 Back up System	- Purchase cloud-based back-up system to simplify disaster recovery efforts.	Administrative Services/ Information Technology	3 years	GF	H

Section 6: Plan Update

Planning Update

When conducting the update, the Planning Team reviewed the entire plan to ensure the information is current. There have been no changes in development that impacted Claremont's vulnerability to hazards since 2015. The Planning Team also reviewed the priorities and validated the priorities in the previously approved plan. Additionally, as detailed in **Section 2: Planning Process,** the Planning Team updated the hazards to include Cyber Disruption and Drought, and also evaluated Climate Change in the Risk Assessment for all hazards. This updated plan reflects the progress in local mitigation efforts, as outlined in the Mitigation Progress Report below.

Mitigation Progress Report

In the prior plan, the Hazard Mitigation Planning Team identified five natural hazards on which to focus their mitigation efforts. The hazards identified were earthquakes, flooding, wildfires, landslides, and windstorms. To address these hazards, the prior Planning Team identified 29 mitigation projects across the following categories:

- Multi-Hazard (MH)
- Fire (FR)
- Earthquake (EQ)
- Severe Weather (SW)
- Flood (FLD)
- Landslide (LND)

The City's mitigation strategy is derived from an in-depth review of the existing vulnerabilities and capabilities outlined in previous sections of this plan, combined with a vision for creating a disaster resistant and sustainable community for the future. This vision is based on informed assumptions, recognition of both mitigation challenges and opportunities and demonstrated by the goals and objectives outlined below. The mitigation measures identified under each objective include an implementation plan for each measure.

During the 2021 update, the Planning Team met to review the existing mitigation strategy and determine if the Plan needed to be revised. During the meeting, the Planning Team determined whether projects were completed, deferred, ongoing or no longer relevant. (See Table 20: Status of 2015 Mitigation Actions Matrix).

Eighteen mitigation action projects were designated as ongoing with relevant priorities. Several of ongoing projects were updated to reflect current efforts.

Three projects were completed and therefore were removed from the 2021 Mitigation Actions Matrix.

Five projects were deferred due to scheduling or funding delays and were included in the 2021 Mitigation Actions Matrix.

Table 17: Deferred Mitigation Action Projects

Project	Reason for Deferral
MH-4 Zoning and General Plan Review land use designations for identified hazard areas in order to minimize development density in disaster-prone areas while recognizing the private property owner's rights. The only mapped areas presently are for liquefaction.	This item will be addressed during the revision to the General Plan Safety Element. Expected completion of this item is by 2022.
MH-6 New Backup Power Provide emergency electrical backup to Joslyn Center.	This item has been delayed due to lack of funding. Staff has applied for two grants that have not been successful. Claremont will continue to seek grant funding for this item and has set a 5-year timeline for completion.
FR-3 General Water Infrastructure Install water infrastructure for use during wildfires including water tank and access road above Claraboya area.	Golden State Water is currently designing water system infrastructure improvements in support of fire flows in the Claraboya area. The goal is to bid and construct these improvements in the fall of 2021 thru the spring of 2022. This item was updated accordingly.
FR-4 Tree Removal - As a fire prevention measure, remove the Eucalyptus trees in Sycamore Canyon.	This item is being addressed with the Sycamore Canyon Trail Project. Phase One was completed and Claremont is still working on funding and plans for Phase Two. Utilizing Proposition A funding, Phase One of the Sycamore Canyon trail repair project was completed. This primarily consisted of relocating the trail head and the installation of dozens of new steps. This work consisted of approximately 400 ft. of trail work. Of the 139 Eucalyptus trees in the canyon, 35 were removed as part of Phase One. Phase Two of this project will consist of additional trail work along the remaining 3,785.57ft. of trail. This work will ensure the

	trail is safe and accessible for all visitors for years to come.
SW-3 Retrofit A/C Units Retrofit air conditioning units in City facilities to be compatible with emergency backup generators.	This project has been delayed due to funding restraints. The City recently completed an energy audit and is exploring a comprehensive project to replace A/C units, solar, and battery backup at multiple City facilities. The feasibility of having A/C units to run on battery backup or generators will be evaluated as part of this project development. Pending financing, this project will proceed in 2021-22.

Three projects were deleted as the Planning Team deemed they were no longer relevant.

Table 18: Removed Mitigation Action Projects

Project	Reason for Deletion
EQ-3 Retrofit Interchange - Seismic retrofit of interchange at Indian Hill Boulevard and Interstate 10	This bridge is rated good for seismic vulnerability and therefore is not on the priority list for CalTrans to retrofit.
LND-1 Landslide Prevention - Mitigate against landslide danger at Mt. Baldy Road and Fergus Falls	This item is no longer relevant as there is no planned work.
LND-3 Thompson Creek - Improvements to Thompson Creek Trail to eliminate debris accumulation and overflow (Mt. Avenue and Pomello)	This item is no longer relevant. The trail does not need improvements to eliminate debris accumulation though as it is a walking trail that is not highly susceptible to overflow.

Table 19: Status of 2015 Mitigation Action Projects

Mitigation Project	Completed	Removed	Deferred	Ongoing	Funding Source	Timeframe	Priority Ranking
Multi-Hazard Projects							
MH-1 Emergency Training +The City will continue to conduct training and coordinate mock emergency exercises so that emergency responders are prepared.				X	GF	Ongoing	High
MH-2 Community Outreach + Partner with outside agencies to provide information regarding local hazards and steps residents can take to be prepared. • Claremont CERT • Brochures on Website				X	GF	Ongoing	High
MH-3 Review of Technology + Purchased an electronic early warning system in order to notify residents of impending emergencies or to distribute critical information. + Purchased a reverse 9-1-1 type system to warn residents of any potential hazards (Everbridge). + Neighborhood eWatch	X				GF, GR	Ongoing	High
MH-4 Zoning and General Plan - Review land use designations for identified hazard areas in order to minimize development density in disaster-prone areas while recognizing the private property owner's rights. The only mapped areas presently are for liquefaction.			X		GF	Ongoing	High
MH-5 Backup Power + Continue to maintain emergency electrical backup for City facilities.				X	GF	Ongoing	High
MH-6 New Backup Power			X		GR	1 Year	High

Mitigation Project	Completed	Removed	Deferred	Ongoing	Funding Source	Timeframe	Priority Ranking
- Provide emergency electrical backup to Joslyn Center.							
MH-7 Amend Building and Fire Codes + Amended Codes for commercial buildings. Now required to be sprinklered if building is greater than 10,000 square feet.				X	GF	Ongoing	High
MH-8 Additional Amendments to existing local Building and Fire Codes - Explore the possibility of amending the local Building Codes to include the following provisions: • Dry Flood-proofing • Wet Flood-proofing • Pad Elevations above flood levels • Strapping foundations • Tying down manufactured homes • Use of post tensioned slabs in liquefaction areas.	X				GF/GR	Ongoing	Medium
MH-9 Capital Improvement Program (CIP) + Continue to biennially update the following items: • Development/extension of roads and other critical infrastructure into disaster-prone areas in a manner that reduces vulnerability. • Upgrading the sizes of culverts or installation of new drainage structures to eliminate the ponding of water on roads • Repair and maintain drainage swales when damaged from extensive rainfall • Other means of minimizing impacts of hazards				X	GF	Biannually	High

Mitigation Project	Completed	Removed	Deferred	Ongoing	Funding Source	Timeframe	Priority Ranking
MH-10 Development Review + Roads should be designed of sufficient width and number of access points to facilitate the safe egress from disaster-prone areas in an expeditious fashion while allowing emergency personnel clear access into the disaster area				X	GF	Ongoing	High
MH-11 Road Improvement - Seek funding and improve infrastructure at Webb Canyon and Mt. Baldy including road widening, culverts, and drainage improvements	X				GR	5 Years	High
Fire Projects							
FR-1 Property Maintenance The City will include yearly reminder in the City newsletter and on the City website to: • Encourage property owners in the Urban Interface area to conduct brush clearance in accordance with Los Angeles County Fire Department Standards. The Los Angeles County Fire Department will conduct brush inspections during the fire season in addition to inspecting hydrants and helicopter spots. • Encourage homeowners to have their chimneys inspected and cleaned. • Encourage property owners in the Urban Interface areas to remove cumulative debris that could contribute to the spread of wildfires.				X	GF	Ongoing	High

Mitigation Project	Completed	Removed	Deferred	Ongoing	Funding Source	Timeframe	Priority Ranking
• Encourage residents to change the batteries regularly in their smoke detectors. In addition, have an operable fire home fire extinguisher. • Encourage residents regarding the proper evacuation procedures by creating an evacuation education and drill program for residents							
FR-2 Fire Extinguisher Training + The City offers fire extinguisher training for its residents and City personnel. Schedule annually with fire equipment recharging.				X	GF	Ongoing	High
FR-3 General Water Infrastructure **-** Install water infrastructure for use during wildfires including water tank and access road above Claraboya area.			X		Private Enterprise Funds, GR	5 years	High
FR-4 Tree Removal - As a fire prevention measure, remove the Eucalyptus trees in Sycamore Canyon.			X		GR	5 years	Medium
FR-5 Brush Clearance + Every May the Fire Department notifies brush clearance directives to private property owners.				X	GF	Annual	Low
FR-6 Brush Clearance - Fund brush clearing project for City-owned properties.				X	GF, GR	Annual	High
Earthquake Projects							

Mitigation Project	Completed	Removed	Deferred	Ongoing	Funding Source	Timeframe	Priority Ranking
EQ-1 Hillside Ordinance + Continue to implement existing hillside ordinance that clusters development and creates open space. When homes are developed in accordance with the City's hillside ordinance, care will be taken in the siting of the home to be setback from the slopes outside of the "convection cone" of intense heat. The City will work with the local Fire authority in determining the appropriate placement of homes.				X	GF	Ongoing	Low
EQ-2 Grading Plans + Continue to require grading plans and geotechnical reports for development.				X	GF	Ongoing	Low
EQ-3 Retrofit Interchange - Seismic retrofit of interchange at Indian Hill Boulevard and Interstate 10.		X			GR	5 years	High
Severe Weather Projects							
SW-1 Street Tree Management + Continue to regularly prune trees and inspect for disease in accordance with the City's established tree maintenance policies.				X	GF, GR	Ongoing	High
SW-2 Underground Utilities + Continue to require the undergrounding of utilities with new construction. Also, explore funding programs/methods to underground existing overhead utility lines throughout the City				X	GF	Ongoing	High
SW-3 Retrofit A/C Units - Retrofit air conditioning units in City facilities to be compatible with emergency backup generators.			X		GR	1 Year	High

Mitigation Project	Completed	Removed	Deferred	Ongoing	Funding Source	Timeframe	Priority Ranking
Flood Projects							
FLD-1 Drainage System Maintenance + Review and maintain local drainage facilities to ensure adequate carrying capacity during times of storms				X	GF	Ongoing	High
FLD-2 Flood Insurance + Encourage local homeowners to purchase flood insurance as needed. + Inform FEMA as modifications/ upgrades are made to our municipal storm drain system and to remap portion of Flood Zone D areas.				X	GF	Ongoing	High
FLD-3 On-site Drainage Facilities + Continue to implement the requirements of the National Pollutant Discharge Elimination System municipal permit for new development, including retention of the first ¾" rainfall as required (1 acre and above).				X			
Landslide Projects							
LND-1 Landslide Prevention - Mitigate against landslide danger at Mt. Baldy Road and Fergus Falls.		X			GR	5 years	High
LND-2 Debris clearance - Mitigate issues related to debris clearance to ensure efficient functioning of drainage system.				X	GF	5 years	High
LND-3 Thompson Creek - Improvements to Thompson Creek Trail to eliminate debris accumulation and overflow (Mt. Avenue and Pomello).		X			GR	5 years	High

Section 7: Plan Maintenance

The Plan Maintenance section of this document details the formal process that will ensure that the Mitigation Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years. This section describes how the City will integrate public participation throughout the plan maintenance process.

Method and Scheduling of Plan Implementation

The Planning Team that was involved in research and writing of the Plan will also be responsible for implementation. The Committee will be led by a Planning Department Senior Planner. Please refer to **Section 2: Planning Process** of the Plan for a full list of Planning Team members.

	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring	X	X	X	X	X
Evaluating					X
Updating					X

Monitoring and Implementing the Plan

Plan Adoption

Adoption of the Mitigation Plan by the City's governing body is one of the prime requirements for approval of the plan. Once the plan is completed, the City Council will be responsible for adopting the Mitigation Plan. The governing body has the responsibility and authority to promote sound public policy regarding hazards. The local agency governing body will have the authority to periodically update the plan as it is revised to meet changes in the hazard risks and exposures in the City. The approved Mitigation Plan will be significant in the future growth and development of the City.

The City Council will be responsible for adopting the Mitigation Plan. This governing body has the authority to promote sound public policy regarding hazards. Once the plan has been adopted, the Assistant City Manager will be responsible for submitting it to the State Hazard Mitigation Officer at California Office of Emergency Services (CalOES). CalOES will then submit the plan to the Federal Emergency Management Agency (FEMA) for review and approval. This review will address the requirements set forth in 44 C.F.R. Section 201.6 (Local Mitigation Plans). Upon acceptance by FEMA, City of Claremont will gain eligibility for Hazard Mitigation Grant Program funds.

Convener

The City Council will adopt the Mitigation Plan and the Planning Team will take responsibility for plan maintenance and implementation. The Assistant City Manager will serve as a convener to facilitate the Planning Team meetings, and will assign tasks such as updating and presenting the Plan to the members of the Planning Team. Plan implementation and evaluation will be a shared responsibility among all of the Planning Team members. The Assistant City Manager will have authority to prepare and approve future amendments to the Mitigation Plan.

Planning Team

The Planning Team will be responsible for coordinating implementation of plan action items and undertaking the formal review process. The convener will assign representatives from City departments, divisions, and agencies, including, but not limited to, the current Planning Team.

In order to make the Planning Team as broad and useful as possible, the City Manager may choose to involve other relevant organizations and agencies in hazard mitigation. These additional appointments could include:

- ✓ A representative from the American Red Cross
- ✓ A representative from Los Angeles County Office of Emergency Services

The Planning Team will meet no less than semi-annually. Meeting dates will be scheduled once the final Planning Team has been established. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan.

Implementation through Existing Programs

The City of Claremont addresses statewide planning goals and legislative requirements through its General Plan, its Capital Improvement Plan, and City Building and Safety Codes. The Mitigation Plan provides a series of recommendations - many of which are closely related to the goals and objectives of existing planning programs. The City of Claremont will implement recommended mitigation action items through existing programs and procedures.

The City of Claremont Building and Safety Division is responsible for adhering to the State of California's Building and Safety Codes. In addition, the Planning Team will work with other agencies at the state level to review, develop and ensure Building and Safety Codes are adequate to mitigate or present damage by hazards. This is to ensure that life-safety criteria are met for new construction.

Some of the goals and action items in the Mitigation Plan will be achieved through activities recommended in the CIP. Various City departments develop the CIP and review it on an annual basis. Upon annual review of the CIP, the Planning Team will work with

the City departments to identify areas that the Mitigation Plan action items are consistent with CIP goals and integrate them where appropriate.

Within six months of formal adoption of the Mitigation Plan, the recommendations listed above will be incorporated into the process of existing planning mechanisms at the City level. The meetings of the Planning Team will provide an opportunity for Planning Team members to report back on the progress made on the integration of mitigation planning elements into City planning documents and procedures.

Evaluating and Updating the Plan

Formal Review Process

The Mitigation Plan will be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The evaluation process includes a firm schedule and timeline, and identifies the agencies and organizations participating in plan evaluation. The Convener or designee will be responsible for contacting the Planning Team members and organizing the annual meeting. Planning Team members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The Planning Team will review the goals and action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Planning Team will also review **Section 4: Risk Assessment** portion of the Plan to determine if this information should be updated or modified, given any new available data. The coordinating organizations responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised.

The Convener will assign the duty of updating the Plan to one or more of the Planning Team members. The designated Planning Team members will have three months to make appropriate changes to the Plan before submitting it to the Planning Team members. The Planning Team will also notify all holders of the City plan when changes have been made. Every five years the updated plan will be submitted to the State Hazard Mitigation Officer at the California Emergency Management Agency and the Federal Emergency Management Agency for review. The Assistant City Manager is authorized to approve future updates and amendments to the Mitigation Plan.

Continued Public Involvement

The City of Claremont is dedicated to involving the public directly in the continual review and updates to the Mitigation Plan. Copies of the plan will be catalogued and made available at City Hall and at all City operated public libraries. The existence and location of these copies will be publicized in City newsletters and on the City website. This site will also contain an email address and phone number where people can direct their comments and concerns. A public meeting will also be held after each evaluation or when

deemed necessary by the Planning Team. The meetings will provide the public a forum in which they can express their concerns, opinions, or ideas about the Plan.

The Public Information Officer will be responsible for using City resources to publicize the annual public meetings and maintain public involvement through the public access channel, web page, and newspapers.

Appendix 1: City Council Resolution

RESOLUTION NO. 2021-50

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLAREMONT, CALIFORNIA, ADOPTING THE LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE

WHEREAS, the preservation of life and property is an inherent responsibility of local, state, and federal government; and

WHEREAS, the City of Claremont developed, adopted, and maintains a Local Hazard Mitigation Plan; and

WHEREAS, the goal of a Local Hazard Mitigation Plan is to minimize, reduce, or eliminate loss of life and/or property; and

WHEREAS, this Local Hazard Mitigation Plan represents a comprehensive description of the City's commitment to reducing, preventing, or eliminating potential impacts of disasters caused by natural and man-made hazards; and

WHEREAS, the City of Claremont must adopt an updated Local Hazard Mitigation Plan in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the City has undertaken a comprehensive planning effort in developing the Local Hazard Mitigation Plan update by organizing resources, assessing risks, and developing and implementing a mitigation plan and monitoring process; and

WHEREAS, the Local Hazard Mitigation Plan establishes a coordinated effort to support mitigation activities, and identifies measures to combat natural and man-made hazards within our City; and

WHEREAS, the City of Claremont agrees to adopt this Local Hazard Mitigation Plan and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the goals and objectives of hazard mitigation within the City of Claremont.

NOW, THEREFORE, BE IT RESOLVED by the Claremont City Council:

SECTION 1. The City Council adopts the updated Local Hazard Mitigation Plan included as an Exhibit to this resolution.

SECTION 2. The City Council directs staff to submit the City's adopted Local Hazard Mitigation to the California Office of Emergency Services (CalOES) and to the Federal Emergency Management Agency (FEMA) for final approval.

SECTION 3. The Mayor shall sign this Resolution and the City Clerk shall attest and certify to the passage and adoption thereof.

PASSED, APPROVED AND ADOPTED this 14th day of September, 2021.

Mayor, City of Claremont

ATTEST:

City Clerk, City of Claremont

APPROVED AS TO FORM:

City Attorney, City of Claremont

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES)ss.
CITY OF CLAREMONT)

I, Shelley Desautels, City Clerk of the City of Claremont, County of Los Angeles, State of California, hereby certify that the foregoing Resolution No. 2021-50 was regularly adopted by the City Council of said City of Claremont at a regular meeting of said Council held on the 14th day of September, 2021, by the following vote:

AYES:	COUNCILMEMBERS:	CALAYCAY, LEANO, MEDINA, REECE, STARK
NOES:	COUNCILMEMBERS:	NONE
ABSTENSIONS:	COUNCILMEMBERS:	NONE
ABSENT:	COUNCILMEMBERS:	NONE



City Clerk of the City of Claremont

Appendix 2: FEMA Virtual Meetings

VIRTUAL MEETINGS:

Guide to Virtual Hazard Mitigation Planning Meetings

This document details tips, resources, and potential platforms to facilitate and host effective virtual hazard mitigation planning meetings.

In any community, many stakeholders or planning partners can provide valuable input into the mitigation planning process, from local officials to regional planning authorities, local businesses, non-profits, and the public. Engaging these stakeholders throughout the hazard mitigation planning process ensures its success—but how can you do so successfully through virtual engagement?

Communities have different approaches to engaging partners, including meetings, open houses, conference calls, or webinars. As virtual strategies become more common, it's important to consider tips that make these as dynamic and interactive as face-to-face meetings. Collecting and recording feedback, which happens throughout the hazard mitigation planning process, can be done remotely using tips and tools that are readily available. In this guide, you'll find scalable ideas for making your virtual hazard mitigation planning process a success.

There are many ways to meet engagement requirements in the plan process: webinars, conference calls, direct phone calls, email exchanges, and forms or surveys. Webinars and conference calls are the most common alternatives to meeting in-person with jurisdictions. Direct phone calls and emails are useful to share important updates and reminders. Forms and surveys can help you solicit specific feedback on plan components. A multi-faceted approach can also help ensure you have received feedback from as many stakeholders as possible. No matter what method you use, be sure to consider simple ways you can improve the message.

SIMPLE TIPS FOR BETTER VIRTUAL ENGAGEMENT

- **Get Ready** – prepare for your meeting by sending out an agenda in advance and, when you can, allow participants to co-create the agenda to ensure there is more buy-in and interest in participating.
- **Start Strong** – when you start your meeting, consider sharing your video and encouraging participants to do the same to make your discussion feel more connected. Remind participants to mute their phones. Try including an icebreaker, along with introductions, when engaging new groups. Remember, when you are on a video conference, people can hear and see how you are feeling, so project your positive side when delivering information.
- **Respect Time** – start and end your meeting on time. Create a clear structure that follows your agenda and share it early in the presentation. You can even add a progress bar to your slides. Finally, make sure that your virtual meeting does not exceed 2 hours.
- **Mix It Up** – plan for two or three people to speak on a call, so people hear a variety of voices. Don't make your meetings solely a report out; that's what emails or print media are for. Use your meetings to discuss and problem solve.
- **Be Visual** – use smart design principles in your presentation that are not too text-heavy. Where possible, turn text into graphics and images that support your talking points. The presentation should be designed with the experience of the audience in mind.
- **Be Interactive** – call out names to engage your audience and provide time for additional questions or feedback at the end of the call. Explore the capabilities of your meeting platform beforehand to see whether you can use polls, breakout rooms, and whiteboards for real-time collaboration.
- **Plan Ahead** – anticipate technical issues by sending slides to participants in advance and ensuring participants have access to your platform. Provide a separate dial-in option for participants unable to join a webinar. Test all equipment and embedded video and audio by doing a practice run.

VIRTUAL STRATEGIES THROUGHOUT THE PLANNING PROCESS

The Federal Emergency Management Agency (FEMA) requires participation from each community seeking plan approval during plan development. Stakeholders and the public must also be given the opportunity to be involved in the planning process. However, there is no requirement for how this happens. You have the freedom to define a planning process that works for your community, and that includes using digital tools and alternative methods of outreach.

Whether you are organizing a virtual meeting or passing along guidance to another organizer, there are different approaches that you can consider and discuss to ensure you're designing the meeting with the audience in mind.

Initial Stakeholder Engagement

Use social media channels to meet stakeholders where they are and inform them about the upcoming planning process. Messages or short recorded videos shared on social media can help you get the word out about the importance of stakeholder involvement. While virtual engagement is ideal for maintaining face-to-face connections, remember that getting the word out is also effective through more traditional methods like radio, newspaper, mailers, and television. You can use your own networks if they can share information in newsletters or other communication channels. All these methods can help you share why stakeholder input is important, and how people can get involved. Whatever your approach, keep your message simple and direct.

Example: Region II is working with the U.S. Virgin Islands to record a short video message that encourages new stakeholders to participate in the hazard mitigation planning process.

Connect communities with existing webinars for online training or consider hosting one via a webinar platform that works best for you. (A summary of the features available on different webinar platforms and others is available in a table at the end of this guide.) Training provides an opportunity for communities and contractors alike to learn about the mitigation planning process and all the elements that FEMA requires for the plan, as well as how to make sure plans are usable and implementable by the community.

Example: IS-318, Mitigation Planning for Local and Tribal Communities, is a course offered by FEMA's Emergency Management Institute. It is a 12-hour interactive web-based course for plan writers and reviewers.

Kickoff Meetings

Host the project goals and documents on a website and share with stakeholders in advance of the first meeting. During the kickoff, share an engaging presentation that visually depicts the overall timeline, important considerations and requirements, and expectations for input. Punctuate the presentation with poll questions to learn where there are gaps in understanding or interest in specific issues.

Risk Assessment

When developing the Risk Assessment, it is important to understand the issues of greatest concern to participating communities. Think about creating an online poll, either sent by email or integrated into a presentation, to find out which hazards have the most impact on the community, as well as what assets are most vulnerable. Provide a section for additional comments to help get a more detailed local perspective.

Mitigation Strategy Meetings

Some communities hold meetings with FEMA and the State or Territory to review mitigation strategies in detail. Webinar platforms include tools for making these virtual sessions more collaborative. For example, virtual breakout rooms in some online platforms allow smaller groups to meet in a focused discussion. Real-time brainstorming and notetaking are also possible using screensharing or virtual whiteboards.

Individual Community Meetings

Coordinate with each community to decide which virtual engagement method works best for them. Conference calls or video conferences with a small group can be a suitable low-cost alternative for in-person meetings. These types of meetings provide an excellent opportunity for communities to discuss the direct impacts of hazards on their vulnerable populations and assets. They can then address these vulnerabilities by developing mitigation actions while they have access to an expert to guide them through the process. Consider creating simple, easy-to-use forms that can help guide your discussion and help you stay organized when taking notes.

Providing hard copies of forms and surveys is a good way to engage in areas where there are technological limitations. In each packet, include a cover letter that explains what each form is used for and why it's important, along with contact information for questions. Forms can include a risk evaluation on how hazards have either increased or decreased in their community or a request for a description of development trends since the previous plan, status updates for previous mitigation actions, or new mitigation actions.

Draft Hazard Mitigation Plan Feedback Session

As an alternative to holding public open houses, advertise the draft plan in newspapers and across social media platforms. Design a webpage where people can easily review different plan sections and comment on the plan. After distributing the plan, host and record a webinar or a live social media session where you address suggestions received. Use the chat box for participant questions during the session. If using a webinar platform, consider virtual breakout rooms to have more intimate discussions on different plan components.

Example: Some communities in Region X use Facebook Live to review draft HMPs.

Host the recorded session online along with a feedback form so those who missed your session can still review and provide additional comments.

OTHER CONSIDERATIONS

When exploring options for virtual engagement, consider inclusive and low-barrier options for those with limited access to technology. Some technologies do not require installation or are easy to set up. Some platforms are available on mobile phones, which may be preferable if individuals are working from home without a computer. Don't forget traditional ways of sharing and getting information out: radio announcements, mail, utility bills, newsletters, television interviews, local newspapers, door hangers, and windshield surveys.

Virtual engagements must also be accessible: consider whether translation is needed when designing your approach and make use of recording, live captions, and transcription capabilities. While recording is an option, it should be done carefully.

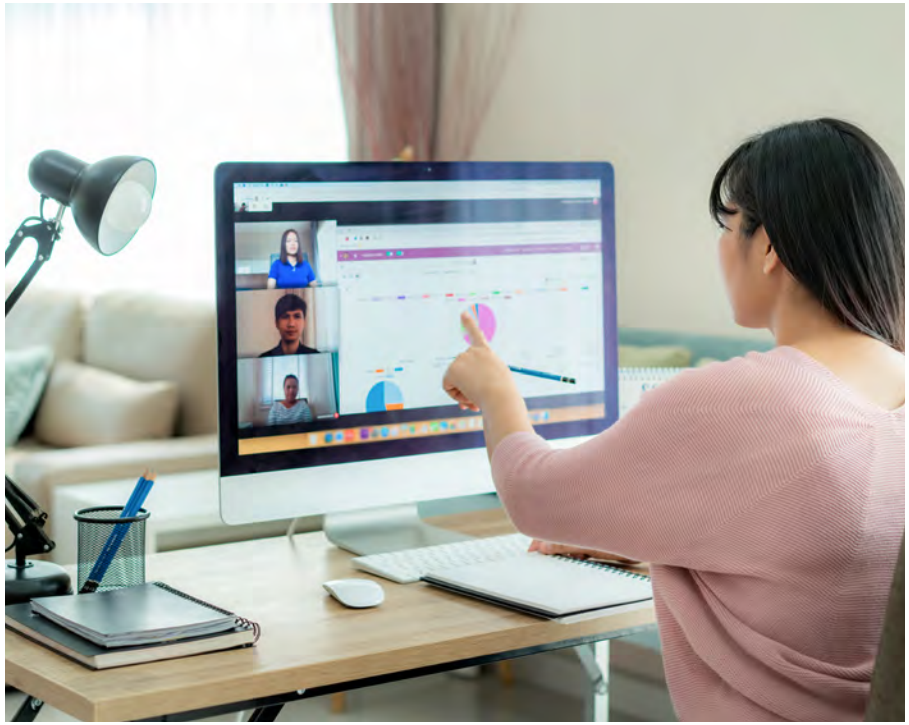
Know your local laws when it comes to open meetings and possible recordings. Laws are determined by the State or Territory, and most require consent before recording. Some virtual meeting platforms have optional recording consent functions built in.

Before selecting a virtual meeting tool, confirm that they meet security standards for everyone involved. You can prevent your meeting from being hijacked by unidentified individuals by making the meeting private, not sharing the meeting link on public online forums, using passwords or waiting rooms on certain meeting platforms, and limiting screensharing to the host only.

When choosing a virtual platform, if FEMA will be hosting the call or participating, make sure that you are using their approved methods, as there are security requirements that need to be vetted beforehand.

ADDITIONAL RESOURCES ON VIRTUAL MEETINGS TIPS AND TOOLS

- What It Takes to Run a Great Virtual Meeting
  Harvard Business Review
- Techniques for Facilitating Virtual Meetings
  Office for Coastal Management, DIGITALCOAST, National Oceanic and Atomospheric Administration (NOAA)



Appendix 3: Public Outreach Documentation

1. City LHMP Update Website
2. Community Meeting #1 Invitations and Materials
3. Community Meeting #2 Invitations and Materials
4. Stakeholder Meeting Materials
5. Community Meeting #3 Invitations and Materials

1. City LHMP Update Website

Want To Know More?

City of Claremont 2015 Natural Hazards Mitigation Plan (PDF)

Hazard Mitigation Planning | FEMA.gov

Police Department
- Proposed Police Facility
- About Us
- Annual Reports
- Community Meeting Videos
- Community Programs
- Crime Prevention
- Department Services
- Department Training and Policies
- Emergency Preparedness
  - Local Hazard Mitigation Plan
  - Local Hazard Mitigation Plan Update
  - Emergency Preparedness Forms
- Employment Opportunities
- Inquiries & Information
- Overnight Parking
- Police Commission Updates
- Police Press Releases
- Police News
- Reporting Neighborhood Concerns
- Vehicle & Traffic Safety
- Volunteer Opportunities
- AB 109 Prop 47 Prop 57 Information
- Contact Us

LOCAL HAZARD MITIGATION PLAN UPDATE

Local Hazard Mitigation Plan Update – Community Meeting

Wednesday, July 14, 2020

6:00 PM – 7:00 PM

The community is invited to participate in a meeting with staff and the City's consultant to review the draft Local Hazard Mitigation Plan Update. The meeting will be held via Zoom Webinar on Wednesday, July 14 at 6 PM. The City's Local Hazard Mitigation Plan must be updated every five years to ensure that the City properly assesses the probability of various types of natural and man-made hazards and their impacts to the community in order to maintain eligibility for State and Federal grant funding. With a plan in place, City staff can continue to prioritize projects and the City will continue to be eligible to obtain FEMA pre- and post- disaster grant funding.



Click Here for Meeting Calendar Link

Purpose

The City of Claremont is beginning the process of updating our Local Hazard Mitigation Plan (LHMP). The purpose of the update and the LHMP is to:

- Be compliant with FEMA requirements.
- Identify the City's natural, environmental, and man-made hazards.
- Develop a risk assessment and mitigation plan for those hazards.
- Improve emergency management during an event.
- Identify projects that could potentially reduce risks in the community.

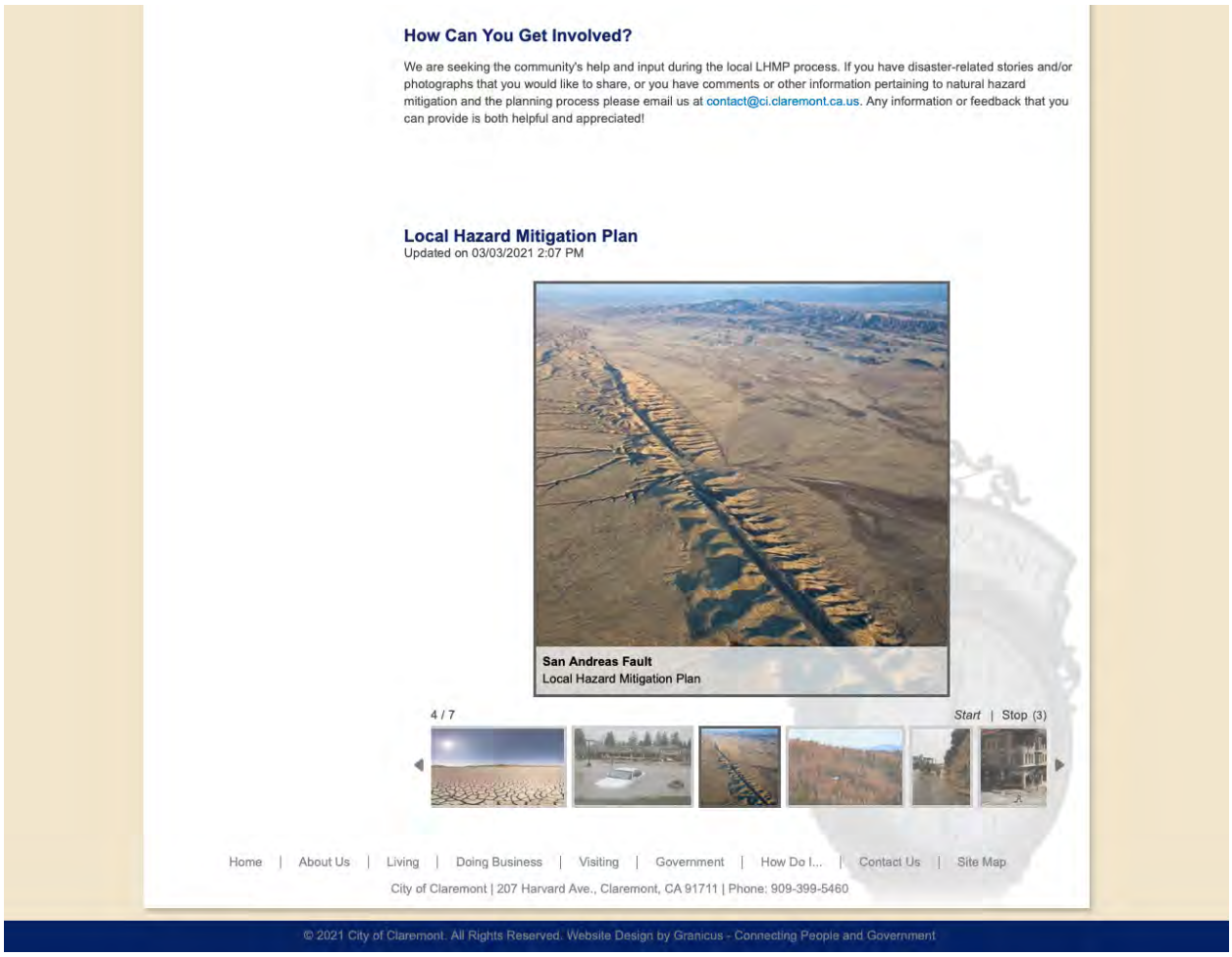
The City's Hazard Mitigation Plan must be updated every five years to ensure that the City properly assesses the probability of various types of natural and man-made hazards and their impacts to the community in order to maintain eligibility for State and Federal Grant funding. With a plan in place, City staff can continue to prioritize projects and the City will continue to be eligible to obtain FEMA Mitigation Grant Funds if a disaster is declared.

How is our LHMP being prepared?

The City has assembled a Hazard Mitigation Planning Committee (HMPC), which includes representatives from public safety officials and City departments, and will guide the overall development of our LHMP. The HMPC is supported by engaged private citizens, key stakeholders, and technical consultants. Together, these participants form the project team responsible for preparing our plan.

What can I do now to be better prepared for disasters?

- Know the hazards that may affect you at your home, work, or school. You can find out more at http://myhazards.caloes.ca.gov
- Assemble an emergency kit for your home. In a disaster, you may have to rely on supplies in your emergency kit for at least three days. Be sure to include supplies for any pets and anyone in your home with special needs. Learn more at Emergency Preparedness | City of Claremont.
- Have a disaster plan for your household, including how people should contact each other if a disaster occurs and where you should meet.
- Learn about your neighbors and how to help them. In a disaster, emergency responders may not be able to reach your neighborhood for a while. Know if your neighbors have any special needs, and be sure to check on them as soon as you can.
- Make sure your homeowner's or renter's insurance covers you from disasters such as earthquakes and floods. If these disasters occur, having good insurance coverage will help you recover easier.
- Volunteer with an emergency response or community service organization that does work on disaster education and preparation.
- Join Claremont's Community Emergency Response Team (CERT), a group of volunteers trained by the Claremont Police Department to assist emergency responders during disasters. Training is free and offered at times throughout the year. Learn more at Community Emergency Response Team (CERT) | City of Claremont.


How Can You Get Involved?
We are seeking the community's help and input during the local LHMP process. If you have disaster-related stories and/or photographs that you would like to share, or you have comments or other information pertaining to natural hazard mitigation and the planning process please email us at contact@ci.claremont.ca.us. Any information or feedback that you can provide is both helpful and appreciated!
Local Hazard Mitigation Plan
Updated on 03/03/2021 2:07 PM
San Andreas Fault
Local Hazard Mitigation Plan
4 / 7
Start | Stop (3)
Home | About Us | Living | Doing Business | Visiting | Government | How Do I... | Contact Us | Site Map
City of Claremont | 207 Harvard Ave., Claremont, CA 91711 | Phone: 909-399-5460
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2. Community Meeting #1

Social Media Invitations



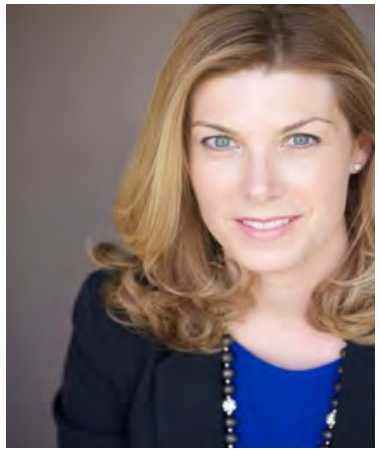


LOCAL HAZARD MITIGATION PLAN





QUINNWILLIAMS



Julie Quinn
Partner



Katherine Williams
Partner



WHAT IS HAZARD MITIGATION?

Hazard mitigation is any action taken to reduce or eliminate the long-term risk to human life and property from hazards

- The goal is to reduce potential losses from future disasters

A **Local Hazard Mitigation Plan** identifies policies and actions that can be implemented over the long term to reduce risk and future losses

WHY ARE WE HERE?

A community must review and revise their existing plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities and resubmit it for approval within five years

The goal of this project is to update Claremont's 2015 LHMP and submit it to FEMA for review

3. Community Meeting #2

Social Media Invitations





CITY OF CLAREMONT

LOCAL HAZARD MITIGATION PLAN

COMMUNITY MEETING

quinn williams

Julie Quinn
Katherine Williams



WHY ARE WE HERE?

Claremont is currently updating its **Local Hazard Mitigation Plan (LHMP)**, which will provide information about the community's vulnerabilities to disasters and what we can do to be more prepared

LHMP PROCESS

Major components of **LHMP** process:

- Determine the natural and human-caused hazards that pose a threat to our community
- Review which buildings and infrastructure are vulnerable to these hazards
- Outline a Hazard Mitigation Strategy with specific recommendations to help reduce the threat from these hazards
- Maintain and update the plan, keeping it current in the face of changing conditions
- Climate Change Adaptation Requirement

LHMP PROCESS

Major components of **LHMP** process:

- Determine the natural and human-caused hazards that pose a threat to our community
- Review which buildings and infrastructure are vulnerable to these hazards
- Outline a Hazard Mitigation Strategy with specific recommendations to help reduce the threat from these hazards
- Maintain and update the plan, keeping it current in the face of changing conditions
- Climate Change Adaptation Requirement

RISK ASSESSMENT

Natural Hazards

- Drought
- Earthquake
- Flood
- Landslide
- Wildfire
- Windstorm



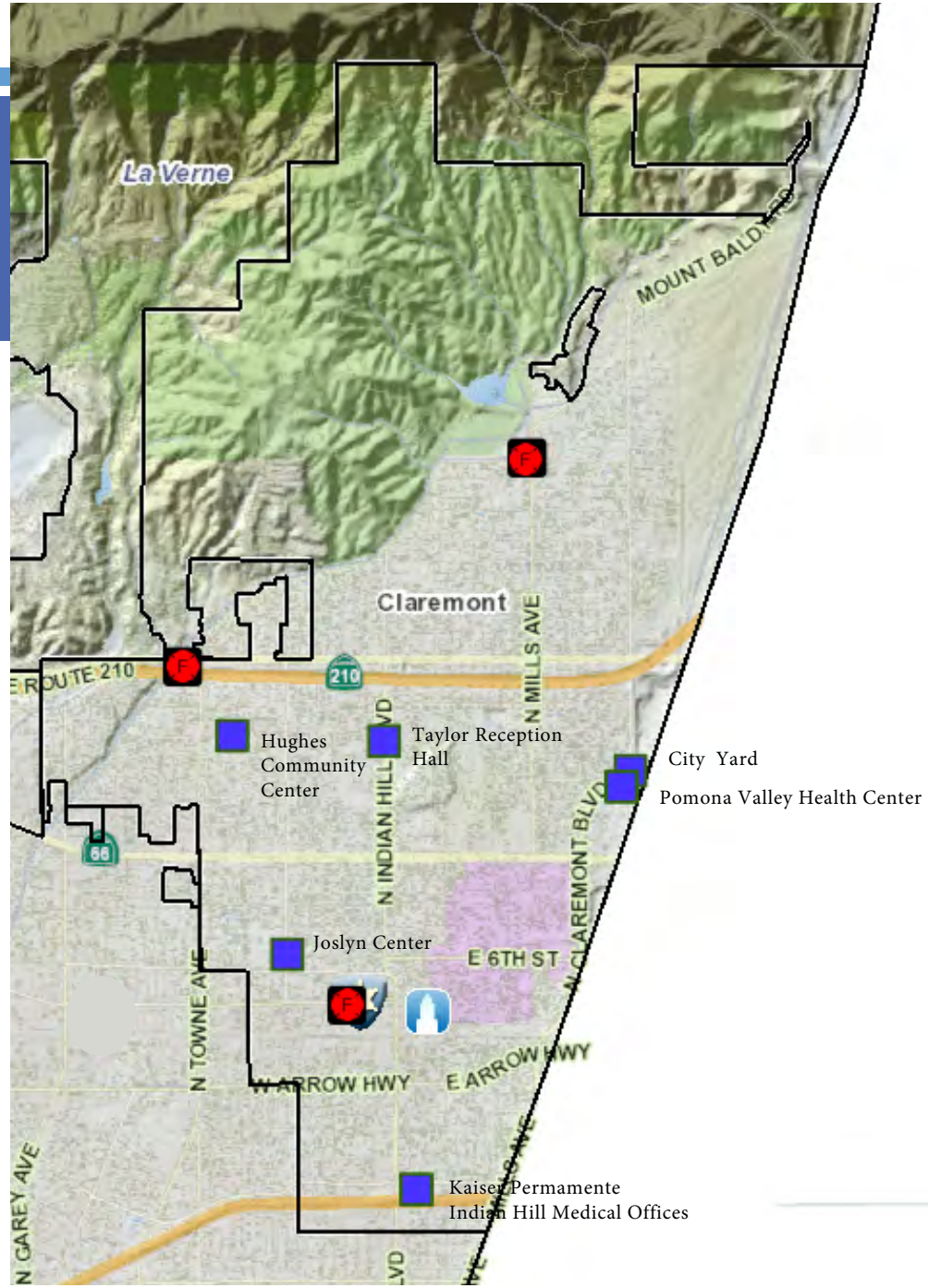
CRITICAL AND ESSENTIAL FACILITIES

Critical Facilities

- City Hall
- Claremont Police Station
- LA County Fire Stations
- City Yard

Essential Facilities

- Hughes Community Center
- Taylor Reception Hall
- Joslyn Center
- Medical Centers

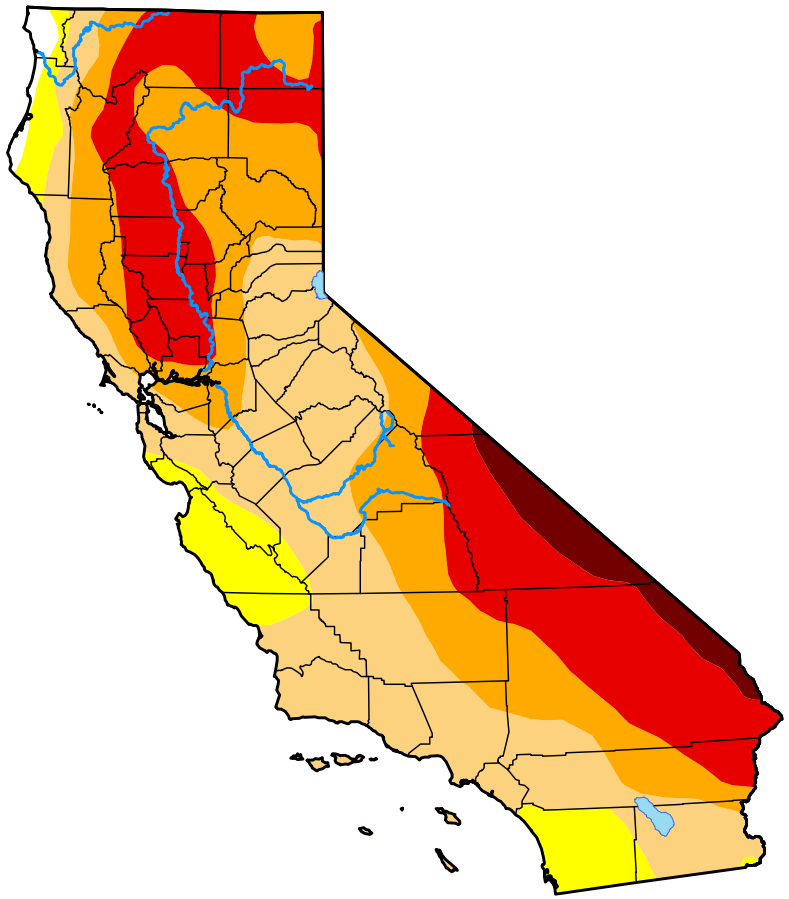


DROUGHT

- City-wide impacts
- Currently Claremont is at level D1 Moderate Drought
- Buildings and critical infrastructure are not directly impacted by drought
- Droughts predicted to get more frequent and severe with climate change

U.S. Drought Monitor

California



March 2, 2021

(Released Thursday, Mar. 4, 2021)

Valid 7 a.m. EST

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

Brian Fuchs
National Drought Mitigation Center

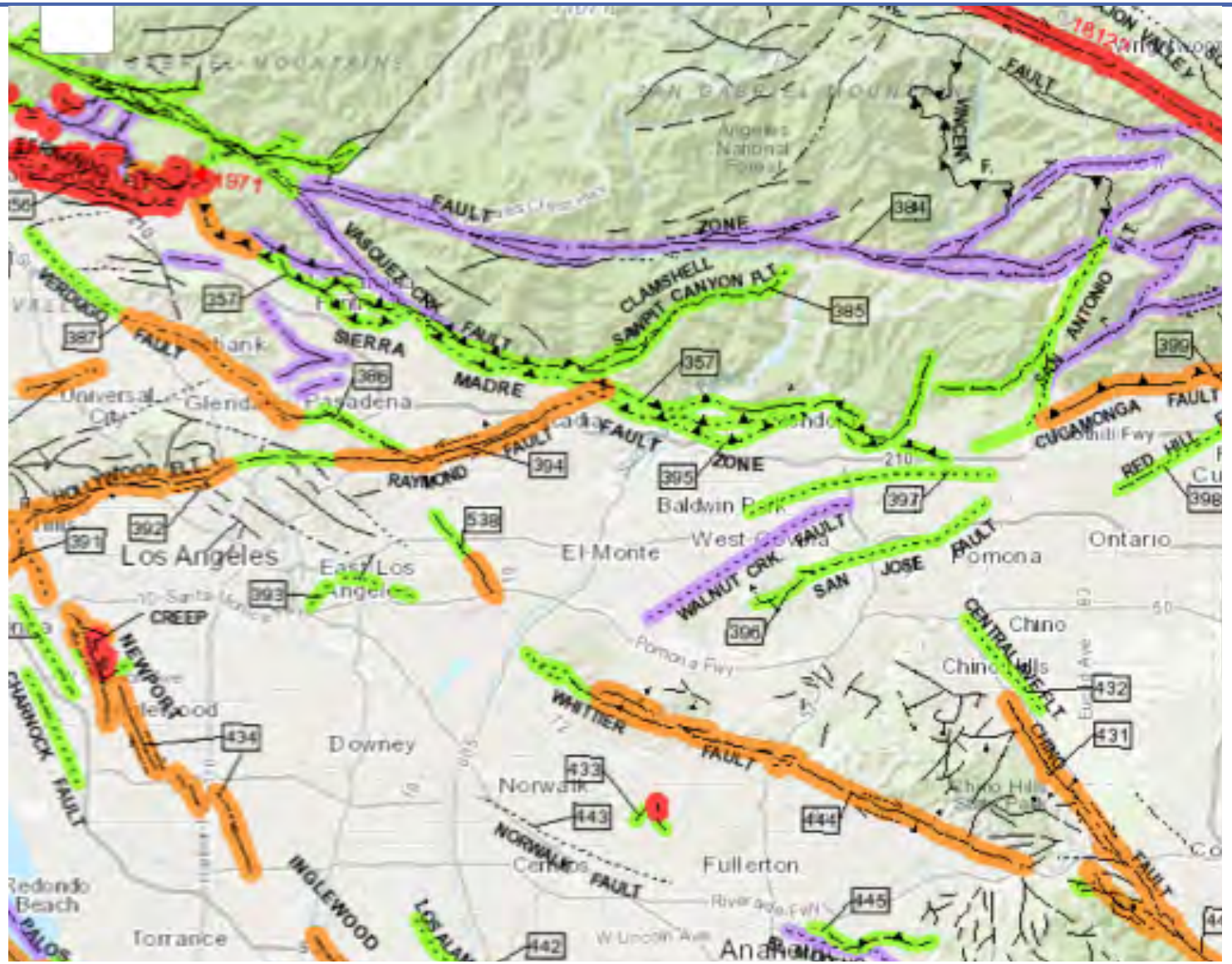
droughtmonitor.unl.edu

EARTHQUAKE



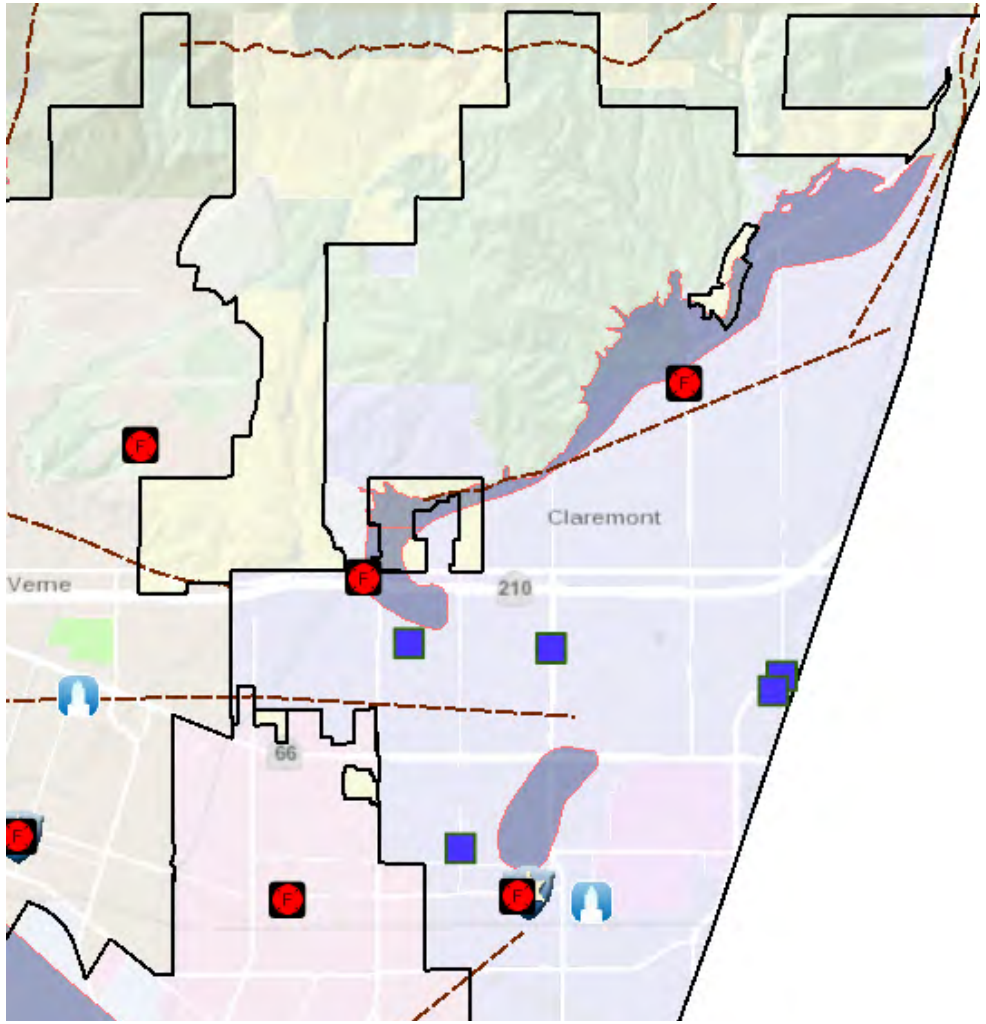
EARTHQUAKE

- Entire region is vulnerable to a significant earthquake
- There are no known climate impacts to earthquake's frequency or severity
- Can also cause landslides and liquefaction



EARTHQUAKE - LIQUEFACTION

- Liquefaction occurs when loose, wet soil loses stability due to sudden shaking
- Major cause of earthquake damage
- Two areas in Claremont are in Liquefaction Zones (Gray Areas)



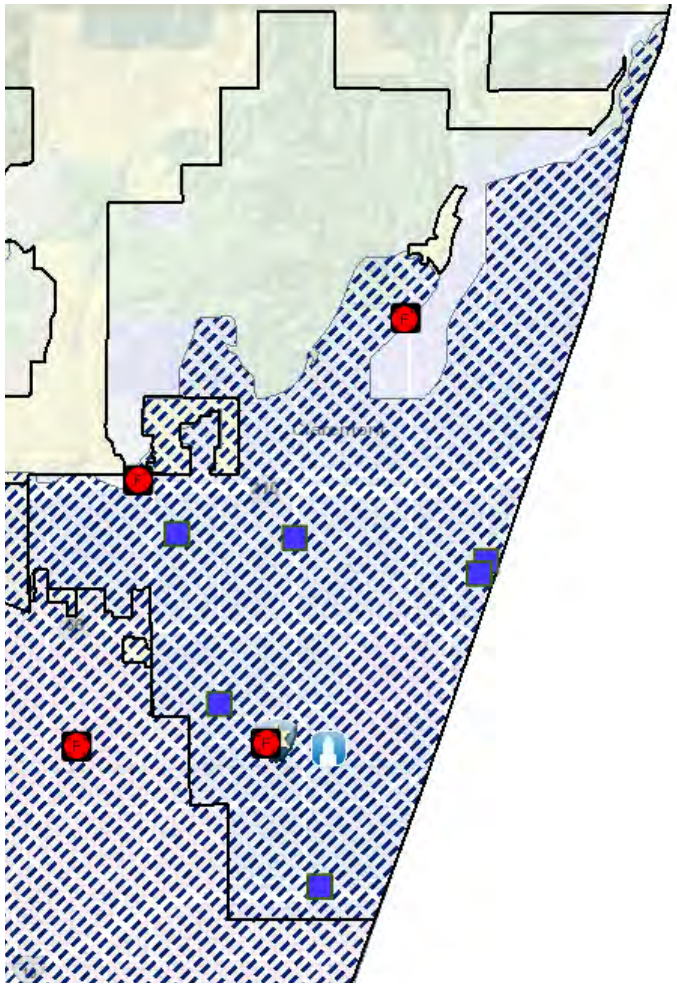
FLOOD



FLOOD - URBAN FLOODING

- Claremont is not in a 100-year floodplain
- Most of Claremont is in a 500-year floodplain
- Climate change predicted to increase intensity of storms and severity of flooding

500 Year Floodplain

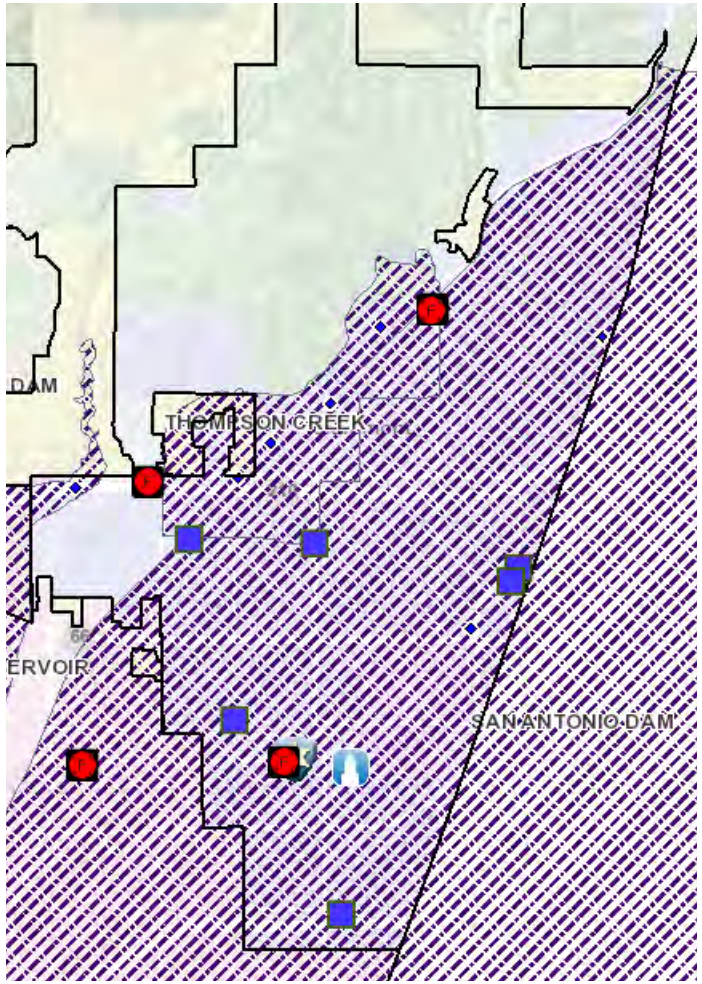


FLOOD - DAM INUNDATION

Claremont is vulnerable to flooding due to dam inundation from three dams:

- San Antonio Dam
- Thompson Creek Dam
- Live Oak Dam

Dam Inundation Areas



LANDSLIDE

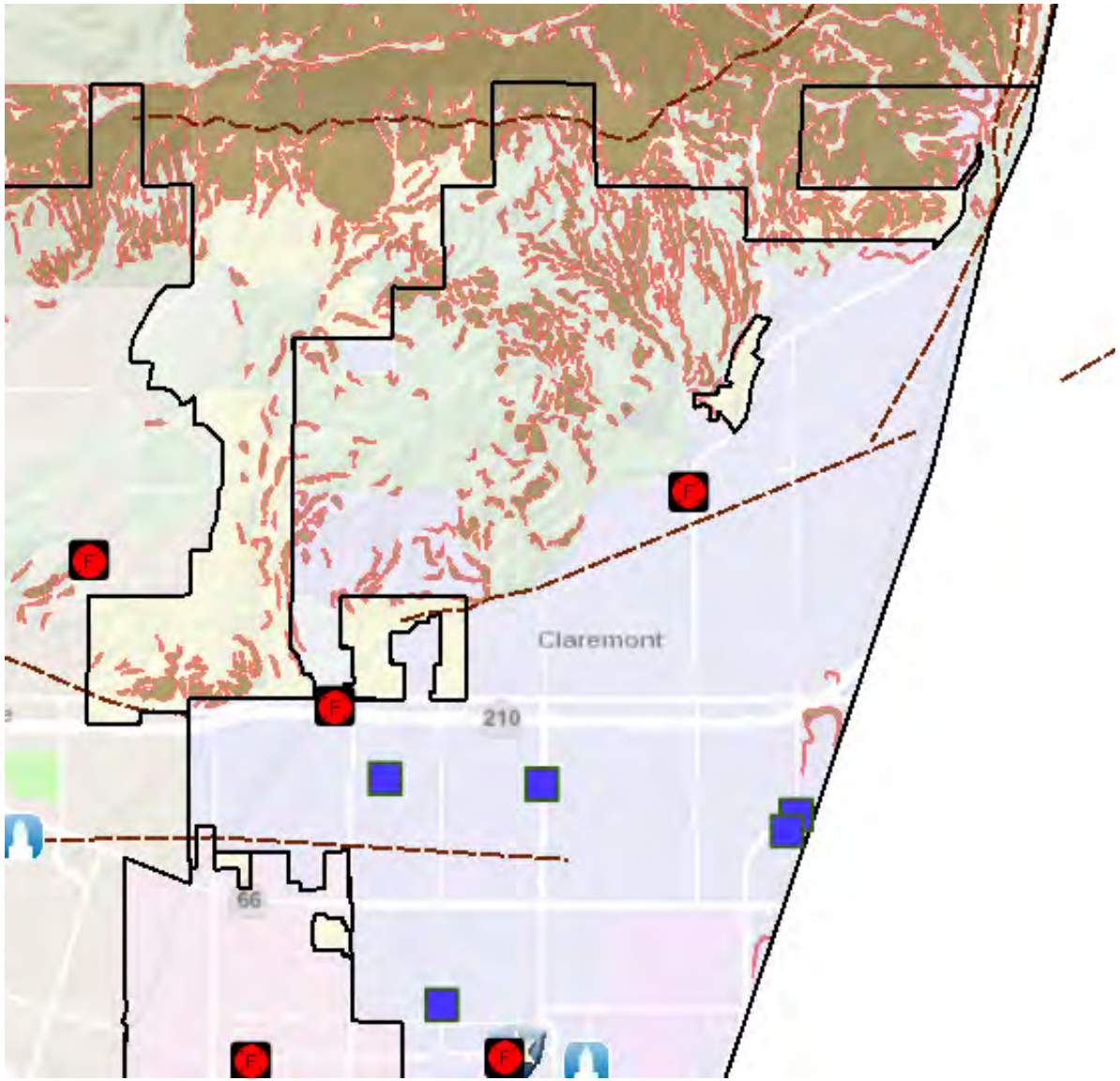


The Montecito city sign along the 101 Freeway. (Katie Falkenberg / Los Angeles Times)

LANDSLIDE

- Common in California - caused by earthquakes, rains
- Can damage roads, buildings and critical infrastructure
- Claremont is primarily at risk in hill and canyon areas
- Areas below hillside and mountains that recently were subjected to wildland fire

Map of Earthquake Induced Landslide Zones



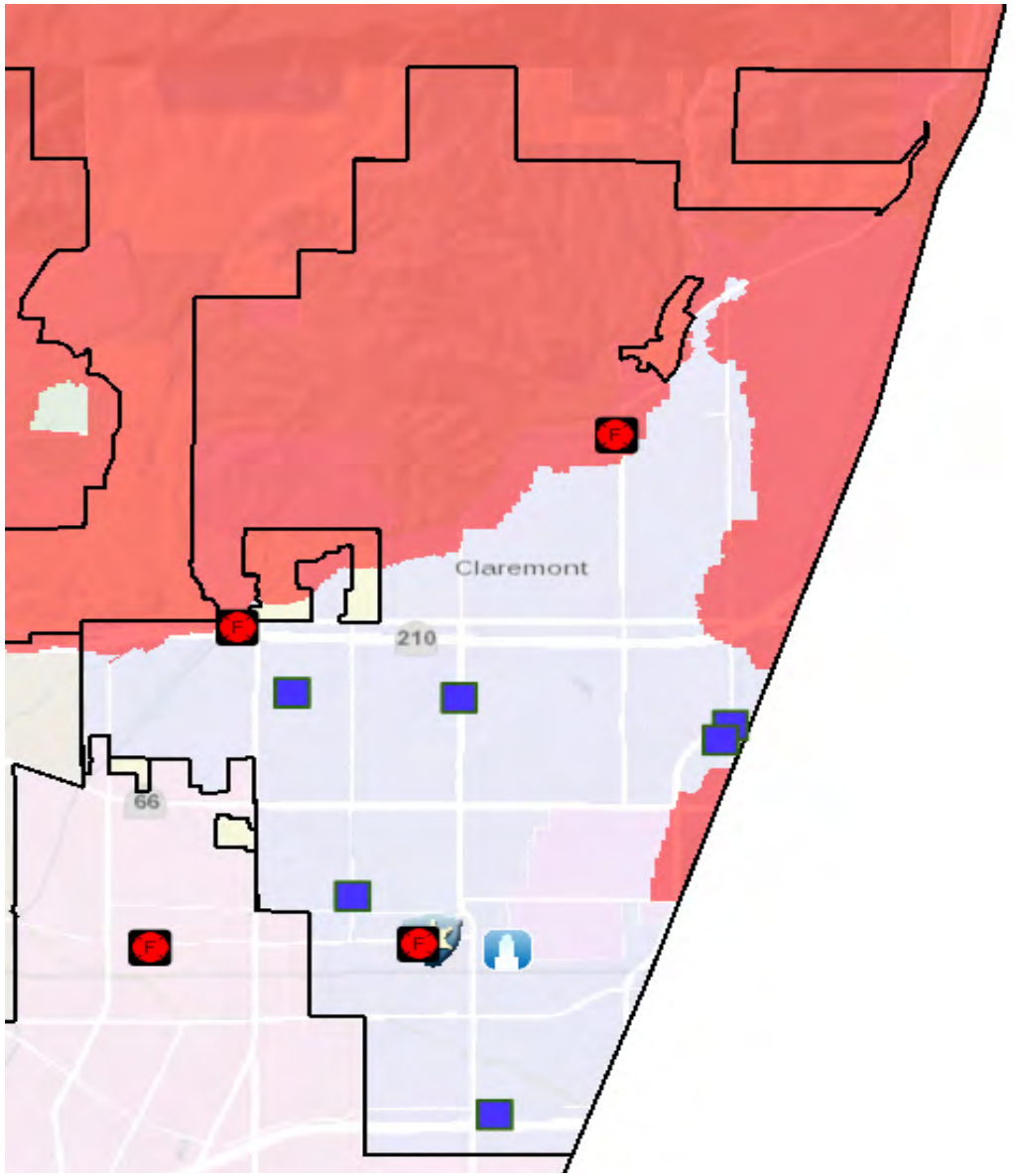
WILDFIRE



WILDFIRE

- California experiences large, destructive wildland fires almost every year
- Foothills and lower mountain areas covered with scrub brush or chaparral fuel fires
- Potential for significant damage to life and property in areas where development is adjacent to densely vegetated areas
- Climate change will likely increase the risk of wildfire

Fire Hazard Severity Zone



WINDSTORM



WINDSTORM

- Entire City is at risk, but particularly canyon areas
- High winds can damage trees, powerlines and utility services
- Fallen trees can damage buildings
- Uncertain if climate change will have an impact on windstorms



HAZARDS RANKED BY RISK

1. Earthquake
2. Wildfire
3. Windstorm
4. Landslide
5. Flood
6. Drought

NEXT STEPS

- Project Team will review and update mitigation strategies
- Updated Draft Plan will be made available for Public Comment
- Project Updates will be provided on City's LHMP webpage on site: https://www.ci.claremont.ca.us

QUESTIONS

If you have additional questions, please contact:

contact@ci.claremont.ca.us

4. Stakeholder Meeting

CITY OF CLAREMONT

LOCAL HAZARD MITIGATION PLAN

STAKEHOLDER MEETING



AGENDA

1. Project Overview
2. Key Dates
3. Hazard Review
4. Mitigation Strategy Overview
5. Stakeholder Updates

LHMP PROCESS

1. Risk Assessment
2. Mitigation Strategy
3. Stakeholder Engagement
4. Community Engagement
5. Updated Mitigation Strategy
6. Public Review of Plan
7. Final Plan
8. Submit for Approval

ESTIMATED DATES

May 12: Stakeholder Outreach Meeting

June 30: Draft Plan Update

Community Meeting and 2-week comment period

August 30: Submit to CalOES

LHMP PROCESS

Major components of **LHMP** process:

- Determine the natural and human-caused hazards that pose a threat to our community
- Review which buildings and infrastructure are vulnerable to these hazards
- Outline a Hazard Mitigation Strategy with specific recommendations to help reduce the threat from these hazards
- Maintain and update the plan, keeping it current in the face of changing conditions
- Climate Change Adaptation Requirement

CLIMATE IMPACT REQUIREMENT

New requirement:

- California Government Code § 65302(G)(4) requires local jurisdictions to review and update their safety elements upon the next revision of an LHMP on or after January 1, 2017, or if a local jurisdiction has not adopted an LHMP, beginning on or before January 1, 2022, as necessary to address climate adaptation and resiliency strategies.

HAZARDS

1. Earthquake
2. Flood
3. Landslide
4. Wildfire
5. Windstorm
6. Drought

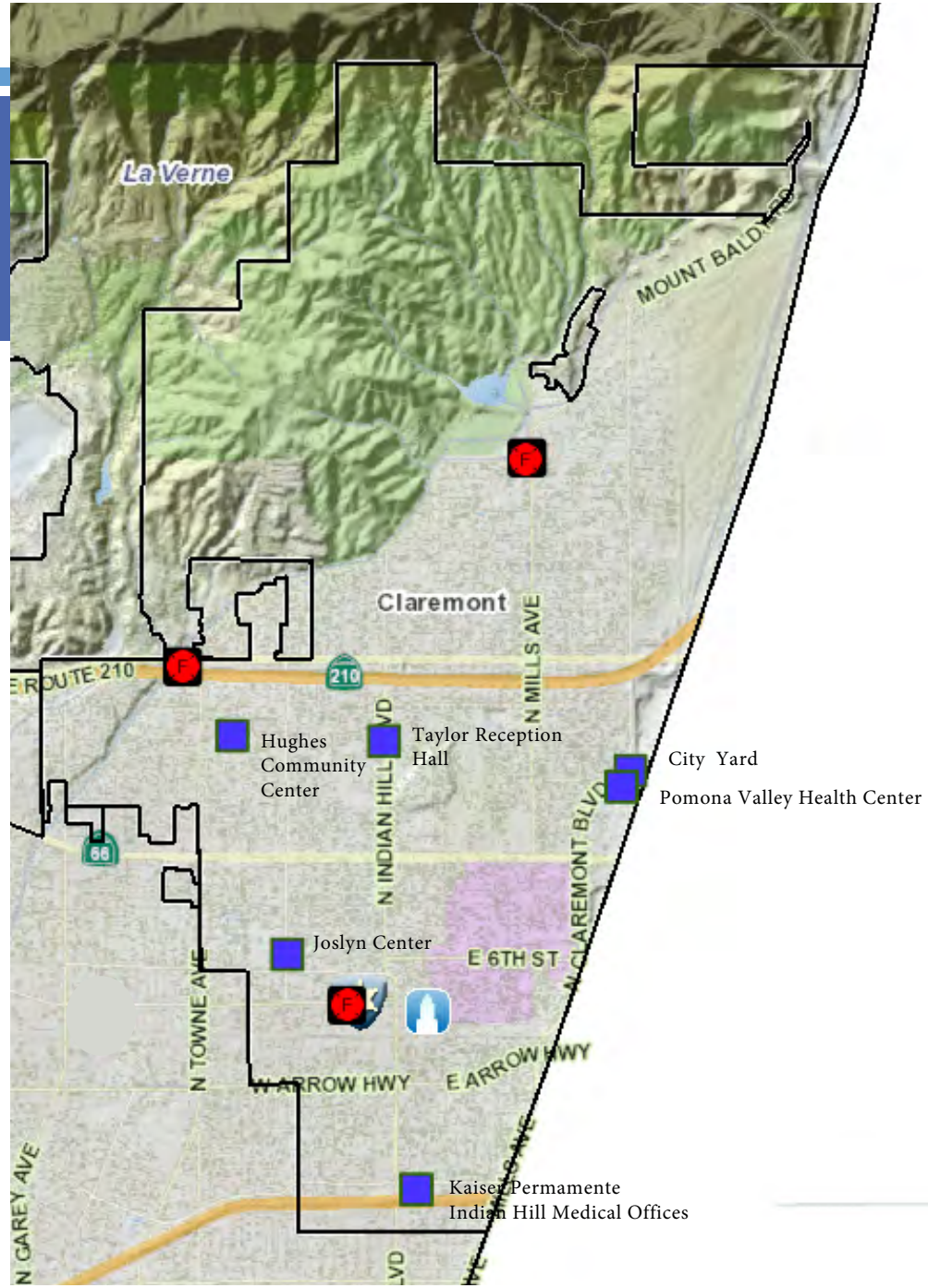
CRITICAL AND ESSENTIAL FACILITIES

Critical Facilities

- City Hall
- Claremont Police Station
- LA County Fire Stations
- City Yard

Essential Facilities

- Hughes Community Center
- Joslyn Center
- Medical Centers
- Taylor Reception Hall



RISK ASSESSMENT




Earthquake


Wildfire


Windstorm


Landslide
Montecito
POP 10,000
ELEV 193


Flood
STOP


Drought

MITIGATION STRATEGY

A *mitigation strategy* provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources

TYPES OF MITIGATION ACTIONS

- Local Plans and Regulations
- Structure and Infrastructure Projects
- Natural Systems Protection
- Education and Awareness

MITIGATION PLAN ITEMS

Multi-Hazard

- Emergency Training
- Community Outreach
- Alerts and Warning
- Zoning and General Plan
- Back Up Power
- Building and Fire Codes
- Capital Improvement Program
- Development Review

Highlight Resiliency Project: Solar Power

The City is conducting an energy audit to explore installing solar with battery backup at several City facilities including Hughes Center, Police Department, City Yard, and Taylor Hall.

This is part of the Trane Energy Improvement Project.

Timeframe: End of 2022

Funding: This will be a cashflow neutral project funded by repayable loans that will be offset and paid for by energy savings.



MITIGATION PLAN ITEMS

Fire

- Fire Mitigation and Community Preparedness Outreach
- Fire Extinguisher Training
- General Water Infrastructure Improvements
- Tree Removal
- Brush Clearance

Earthquake

- Hillside Ordinance
- Grading Plans

Severe Weather

- Street Tree Maintenance
- Underground Utilities
- Retrofit A/C Units

Flood

- Drainage System Maintenance
- Flood Insurance
- Drainage Facilities

Landslide

- Debris Clearance

STAKEHOLDER INPUT

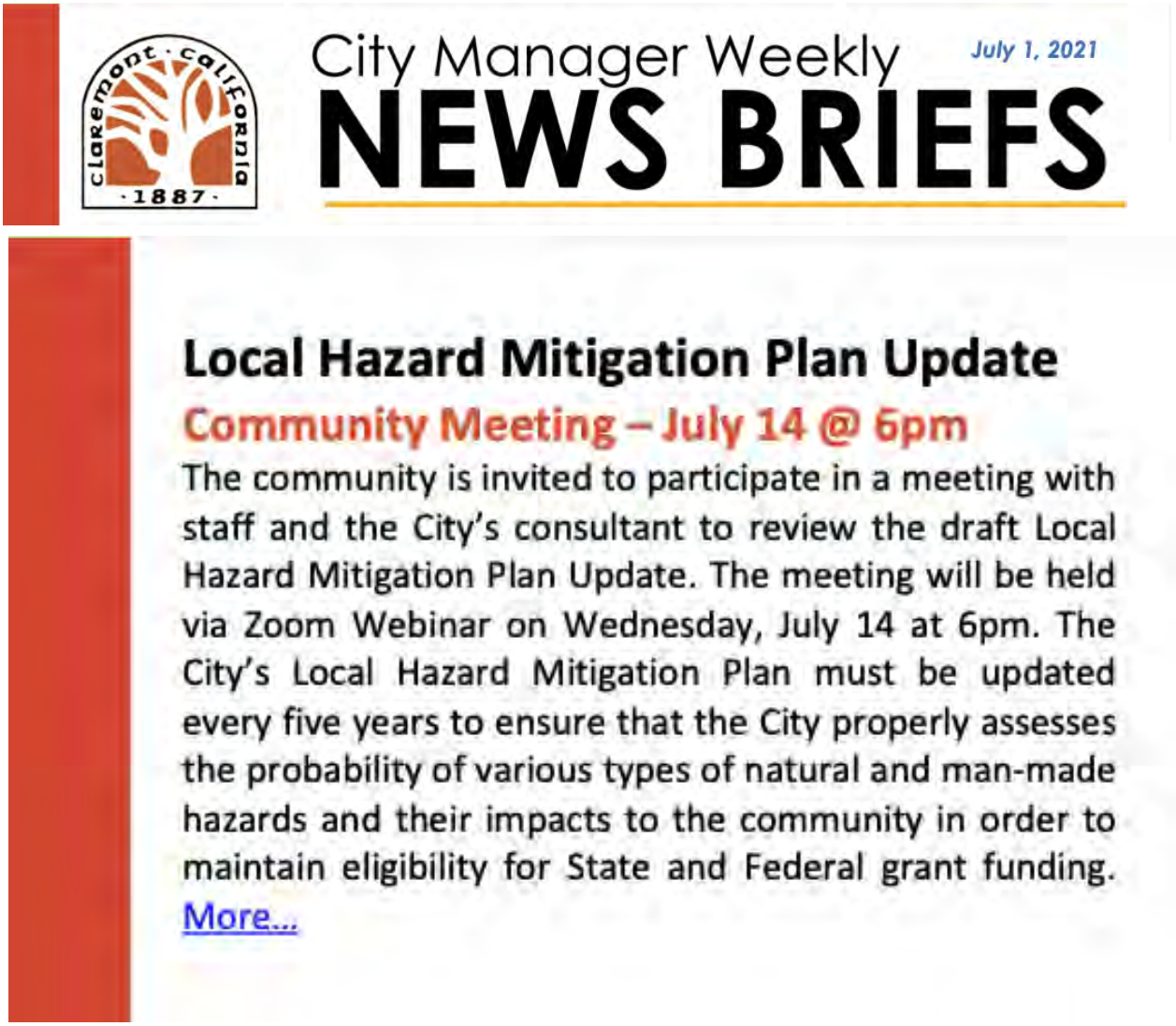
Stakeholder updates?

NEXT STEPS

- Project Team will review and update mitigation strategies
- Updated Draft Plan will be made available for Public Comment
- Project Updates will be provided to the LHMP webpage on the City's website: https://www.ci.claremont.ca.us

4. Stakeholder Meeting

5. Community Meeting #3



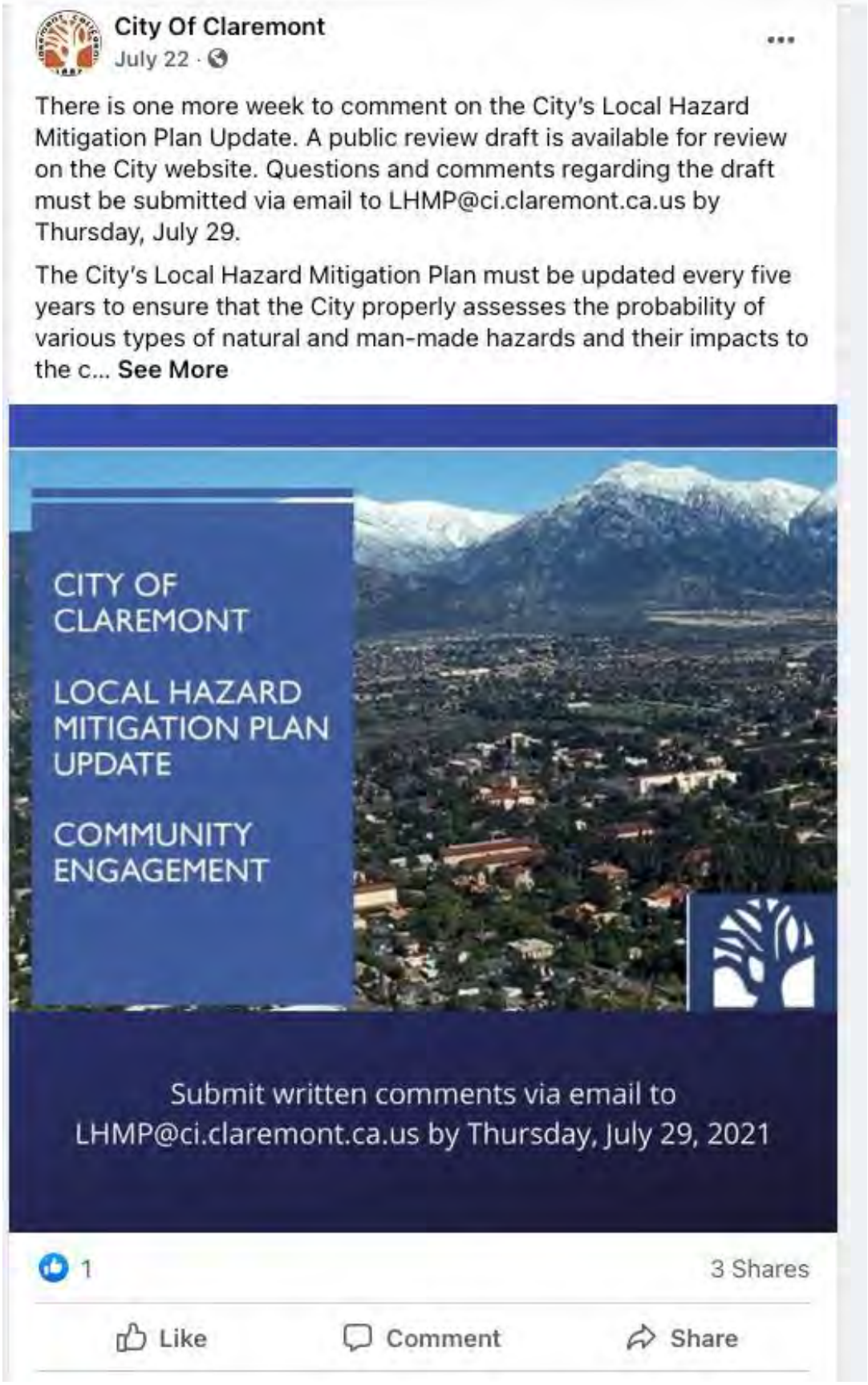
City Manager Weekly July 1, 2021

NEWS BRIEFS

Local Hazard Mitigation Plan Update

Community Meeting – July 14 @ 6pm

The community is invited to participate in a meeting with staff and the City's consultant to review the draft Local Hazard Mitigation Plan Update. The meeting will be held via Zoom Webinar on Wednesday, July 14 at 6pm. The City's Local Hazard Mitigation Plan must be updated every five years to ensure that the City properly assesses the probability of various types of natural and man-made hazards and their impacts to the community in order to maintain eligibility for State and Federal grant funding. More...



City of Claremont
Local Hazard Mitigation Plan



CITY OF CLAREMONT

LOCAL HAZARD MITIGATION PLAN UPDATE

COMMUNITY ENGAGEMENT

quinn williams

AGENDA

1. Welcome
2. Project Overview
3. Hazard Review
4. Mitigation Strategy Overview
5. Questions

PLANNING TEAM

City of Claremont:

- Karlan Bennett, Claremont Police Department
- Jamie Earl, City Manager's Office
- Melissa Vollaro, Human Services Department
- Robert Ewing, Police Department
- Kristin Mikula, Community Services Department
- Vince Ramos, Community Development

Consultant Services:

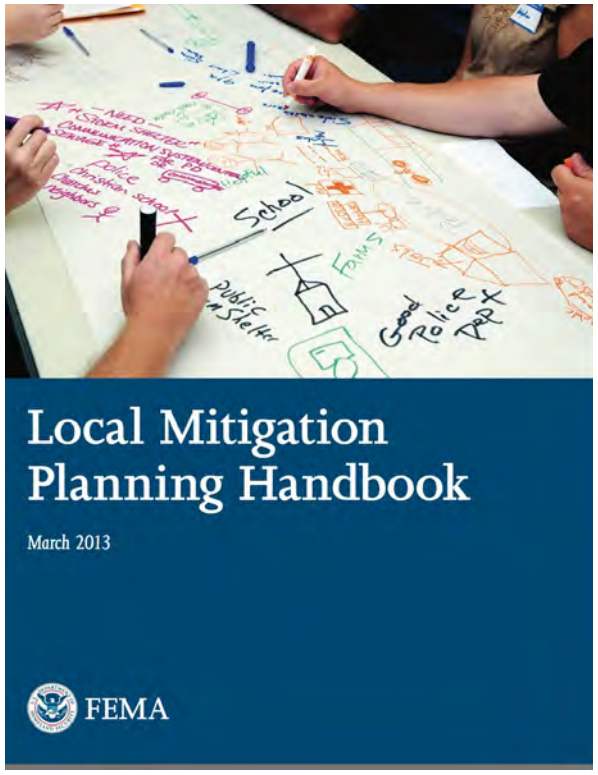
- Julie Quinn, QuinnWilliams
- Katherine Williams, QuinnWilliams

WHAT IS A HAZARD MITIGATION PLAN?

Mitigation plans help states, tribes and local jurisdictions understand their risk from hazards and reduce losses based on those risks.

THE DISASTER MITIGATION ACT OF 2000 (DMA 2000)

- Before 2000, under the Stafford Act, emphasis was on post-disaster mitigation
- DMA 2000 shifted emphasis to mitigation before, rather than after, disasters
- Requires LHMPs to be prepared before local government can receive federal mitigation project grants
- LHMPs are on a 5-year update cycle



LHMP UPDATE PROCESS

1. Risk Assessment
2. Mitigation Strategy
3. Stakeholder Engagement
4. Community Engagement
5. Updated Mitigation Strategy
6. Public Review of Plan
7. Final Plan
8. Submit for Approval

PROJECT SCHEDULE

15 July
Begin Two-week Public Review Period

30 August
Final Draft to Planning Committee

30 September
CalOES Review (up to 45 days)

Consultant Review of Public Comment
1 August

City Council Plan Adoption
14 September

MAJOR COMPONENTS OF LHMP PROCESS

- Determine the natural and human-caused hazards that pose a threat to the community
- Review which buildings and infrastructure are vulnerable to these hazards
- Outline a Hazard Mitigation Strategy with specific recommendations to help reduce the threat from these hazards
- Maintain and update the plan, keeping it current in the face of changing conditions
- Climate Change Adaptation Requirement

CLIMATE IMPACT REQUIREMENT

Recent California requirement:

- California Government Code § 65302(G)(4) requires local jurisdictions to review and update their safety elements upon the next revision of an LHMP on or after January 1, 2017, or if a local jurisdiction has not adopted an LHMP, beginning on or before January 1, 2022, as necessary to address climate adaptation and resiliency strategies.


Earthquake


Wildfire


Windstorm


Montecito
Landslide


STOP
Flood

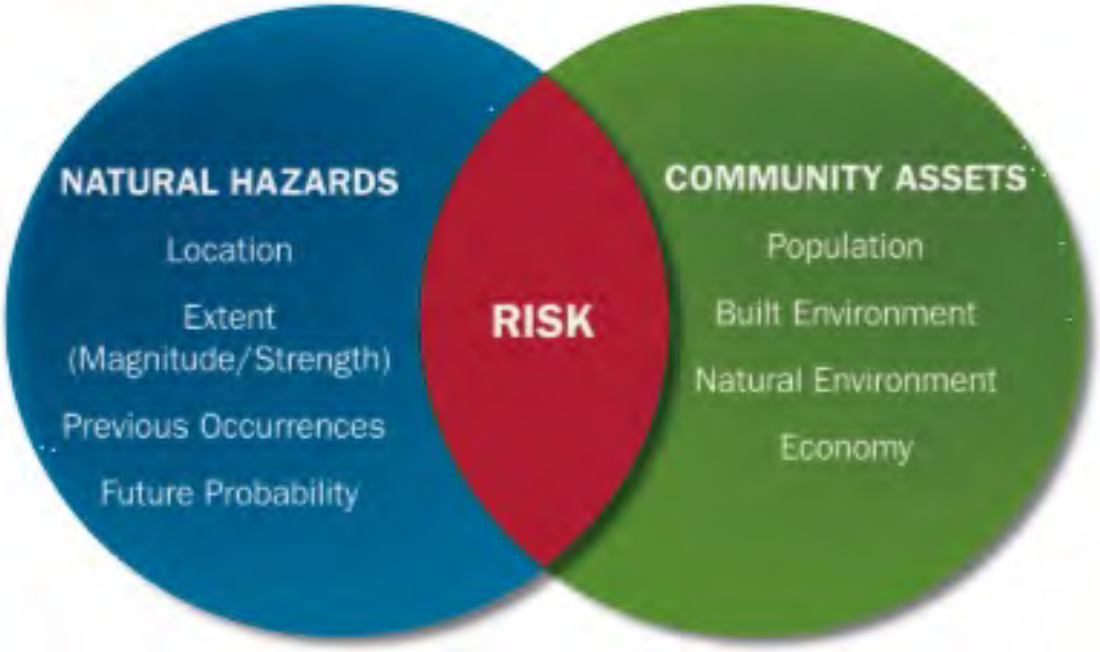

Drought


Cyber
Disruption

RISK ASSESSMENT: SURVEY RESULTS

Hazard	Probability	Weighted 45% (x.45)	Magnitude Severity	Weighted 30% (x.3)	Warning Time	Weighted 15% (x.15)	Duration	Weighted 10% (x.1)	CPRI Ranking
Drought	2.7	1.2	1.3	0.4	1.0	0.2	4.0	0.4	**2.15**
Climate Change	2.8	1.3	1.5	0.5	1.0	0.2	3.3	0.3	**2.21**
Flood	2.2	1.0	2.3	0.7	3.5	0.5	3.5	0.4	**2.55**
Epidemic/ Pandemic	2.8	1.3	2.5	0.8	1.0	0.2	4.0	0.4	**2.58**
Landslide	2.5	1.1	2.0	0.6	3.8	0.6	3.3	0.3	**2.63**
Cyber Disruption	2.7	1.2	2.2	0.7	3.3	0.5	3.3	0.3	**2.68**
Civil Unrest	2.8	1.3	2.2	0.7	3.7	0.6	3.2	0.3	**2.79**
Windstorm	3.5	1.6	2.3	0.7	3.1	0.5	3.2	0.3	**3.05**
Wildfire	3.3	1.5	3.3	1.0	3.9	0.6	3.8	0.4	**3.47**
Earthquake	3.3	1.5	3.8	1.2	4.0	0.6	3.8	0.4	**3.63**

RISK ASSESSMENT



Note: Modified from U.S. Geological Survey and Oregon Partnership for Disaster Resilience Models.

Source: FEMA LHMP Guide 2013

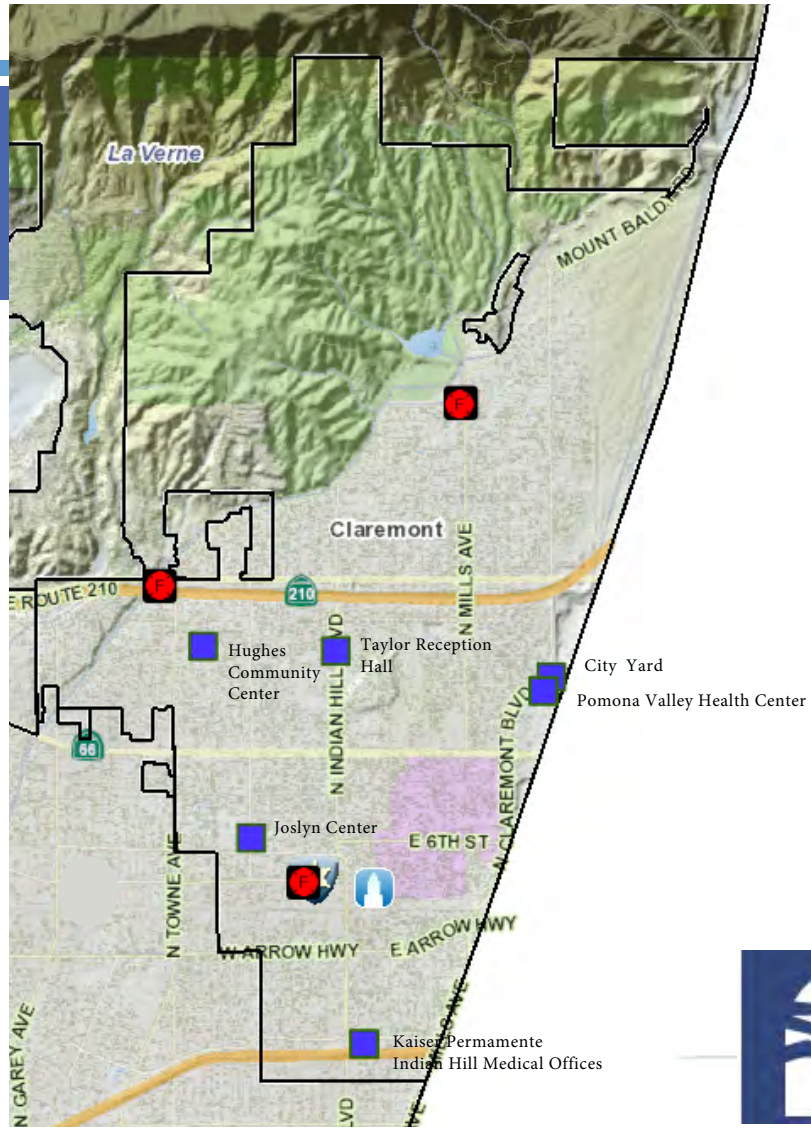
CRITICAL AND ESSENTIAL FACILITIES

Critical Facilities

- City Hall
- Claremont Police Station
- LA County Fire Stations
- City Yard

Essential Facilities

- Hughes Community Center
- Joslyn Center
- Medical Centers
- Taylor Reception Hall



MITIGATION STRATEGY

A *mitigation strategy* provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources

CLAREMONT MITIGATION GOALS

Protect	Protect Life and Property
Enhance	Enhance Public Awareness
Preserve	Preserve Natural Systems
Encourage	Encourage Partnerships and Implementation
Strengthen	Strengthen Emergency Services

TYPES OF MITIGATION ACTIONS



LOCAL PLANS AND REGULATIONS



STRUCTURE AND INFRASTRUCTURE PROJECTS



NATURAL SYSTEMS PROTECTION



EDUCATION AND AWARENESS

TYPES OF MITIGATION PLAN PROJECTS



MITIGATION PROGRESS REPORT

Planning Team reviewed 29 mitigation projects from 2015 LHMP:

- Completed: 3
- Ongoing: 18
- Deferred: 5
- Removed: 3

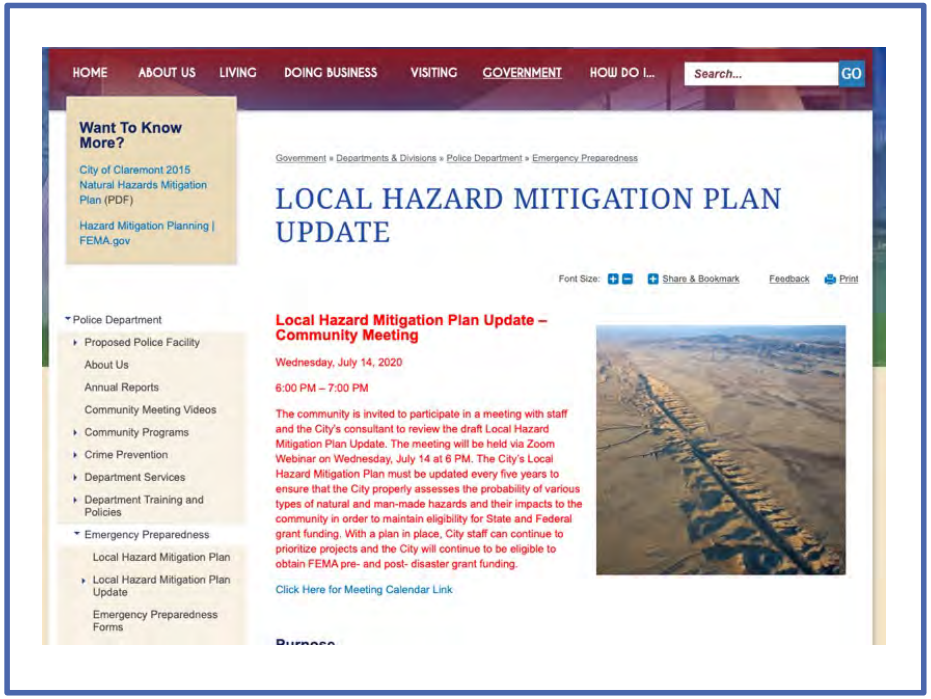
MITIGATION PLAN EXAMPLE PROJECT

Multi-Hazard Resiliency Project: Solar Power

- The City is conducting an energy audit to explore installing solar with battery backup at several City facilities including Hughes Center, City Yard, and Taylor Hall
- This is part of the Trane Energy Improvement Project
- Timeframe: End of 2022, pending funding
- Funding: This would be a cashflow neutral project funded by repayable loans that will be offset and paid for by energy savings



REVIEWING THE PLAN



- Go to the City's website: https://www.ci.claremont.ca.us
- In the "Search bar" type **LHMP Update**
- The LHMP Plan Update document will be posted on Thursday morning, 7/15
- Comments are due by 7/29
- Email: LHMP@ci.claremont.ca.us

QUESTIONS?

LHMP Update webpage on City's website:

https://www.ci.claremont.ca.us

Comments due by 7/29

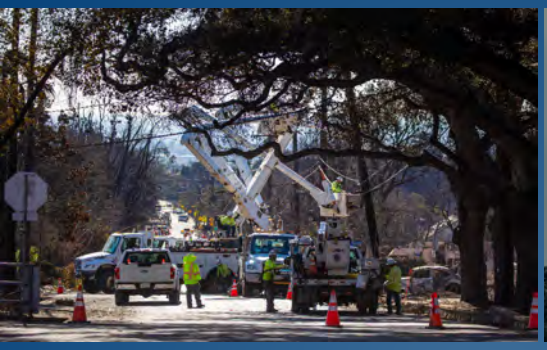
LHMP@ci.claremont.ca.us

APPENDIX C

COUNTY OF LOS ANGELES' ALL-HAZARDS MITIGATION PLAN

2025 County of Los Angeles All-Hazards Mitigation Plan

Chief Executive Office - Office of Emergency Management









Acknowledgement

The Los Angeles County Board of Supervisors gratefully acknowledges the following agencies/jurisdictions who contributed to the development of this plan.

County Departments

Aging and Disabilities
Chief Executive Office
Chief Sustainability Office
Beaches and Harbors
Economic Opportunity
Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

Cover Photo Credits: Los Angeles County Chief Executive Office, Countywide Communications Branch; Los Angeles County Department of Public Works

Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

9/9/25
Date

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1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team
	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

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Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview



Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use



Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

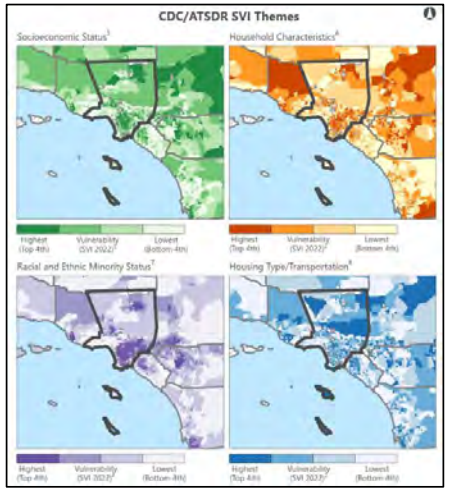


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

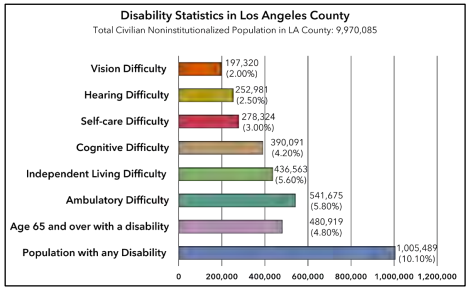


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

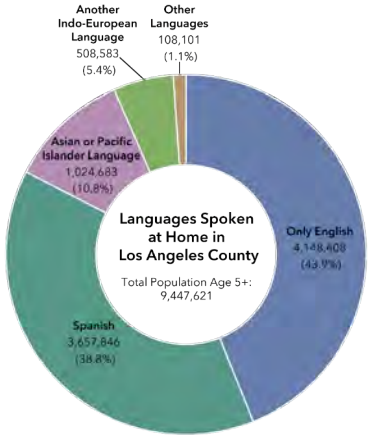


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

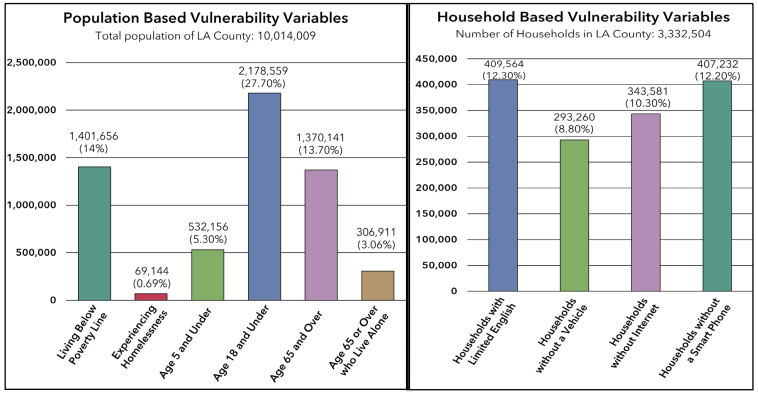


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

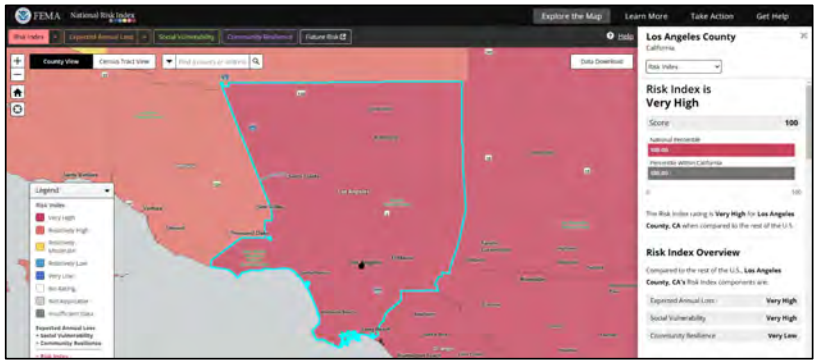


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.

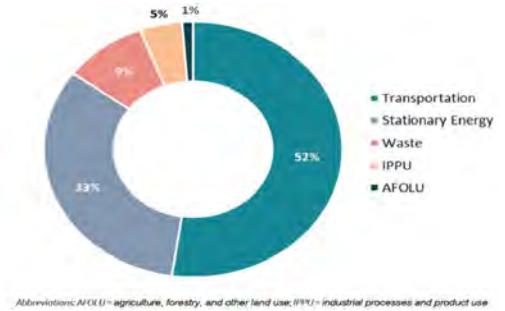


Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
  - Surveys of community needs
  - Consultations with AFN advisory groups
  - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.



- **C-MIST Explanation**
  - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
  - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
  - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
  - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
  - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.



6.2 Wildfire

6.2.1 Nature



Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows—especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD3**: 117.95 sq mi (27.29%)
    - **SD5**: 95.61 sq mi (3.36%)
    - **SD1**: 16.23 sq mi (4.60%)
    - **SD4**: 9.10 sq mi (4.27%)
    - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.



6.3 Earthquake

6.3.1 Nature



Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant. Buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 1,950.78 sq mi (69.50%)
    - **SD3**: 379.41 sq mi (87.99%)
    - **SD1**: 349.17 sq mi (98.95%)
    - **SD2**: 362.95 sq mi (99.99%)
    - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.



6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.



6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	**Figure 6.4.1 Risk of Heat-Related Impacts**
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

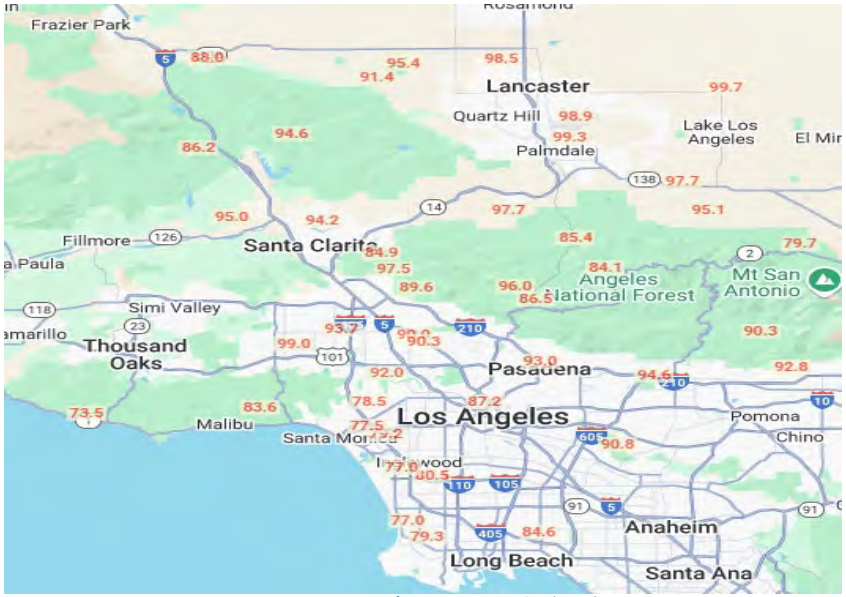


Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.



Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.



6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.



There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

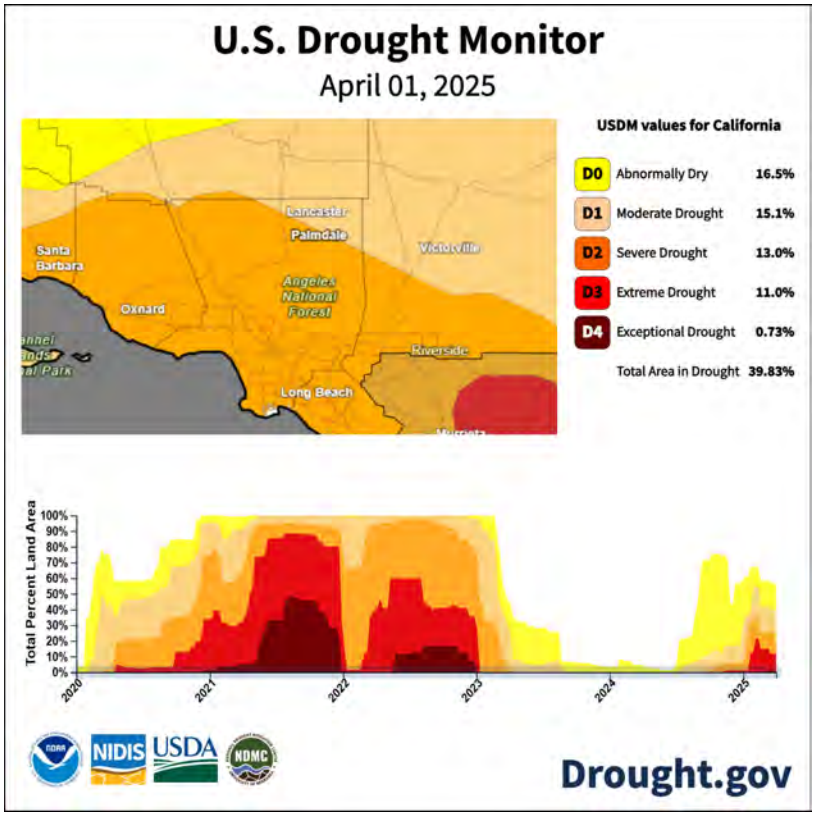


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

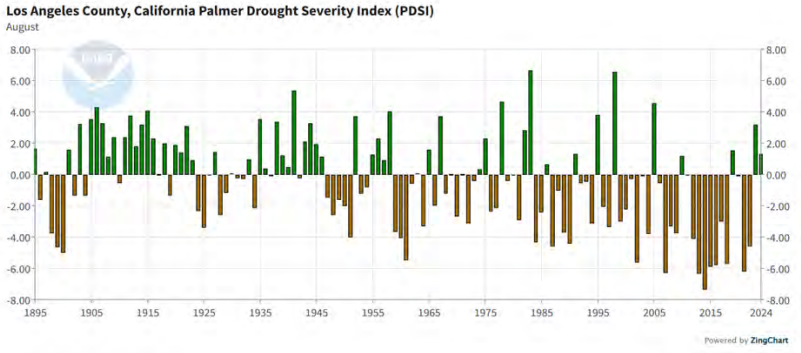


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.



6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.



Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.



6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 223.88 sq mi (7.97%)
    - **SD1**: 162.25 sq mi (45.98%)
    - **SD2**: 66.57 sq mi (18.32%)
    - **SD3**: 25.76 sq mi (5.97%)
    - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
    - Fire Department: 112 (33.22%)
    - Public Works: 92 (40.00%)
    - Health Services: 29 (44.62%)
    - Public Health: 17 (42.50%)
    - Libraries: 30 (34.48%)
    - Parks: 65 (35.50%)
    - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness–making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.



6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.



Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

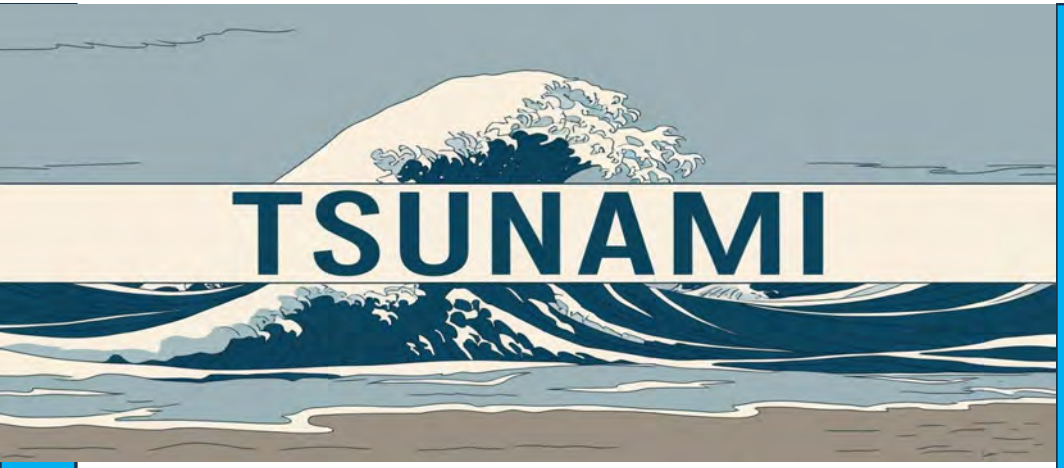
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

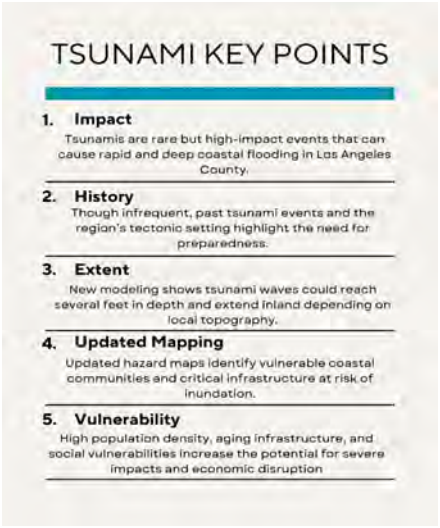
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map—developed using enhanced modeling techniques and updated coastal geomorphology data—highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.



6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.



Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023** (**DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

6.10.9 Summary

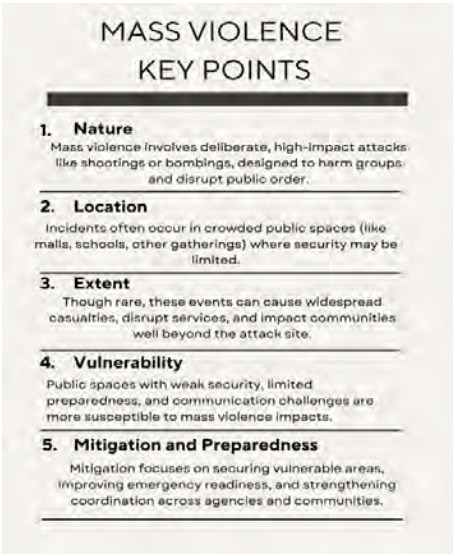
Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.



6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.



- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.



6.12 Cybersecurity Incidents

6.12.1 Nature



Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:

- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents—both in terms of economic impact and service disruption—highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.



6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

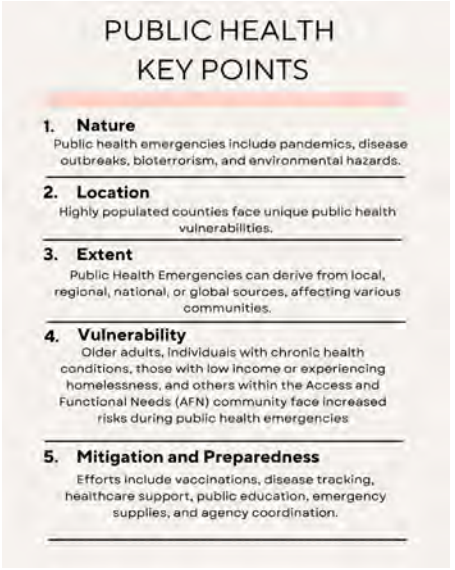
- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.



6.14 Public Health Emergencies

6.14.1 Nature



Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

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7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* **Land Movement** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.	*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**
Source: Los Angeles County Department of Public Works	
Type: Structural and Infrastructure Projects	
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.	*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**
Source: Los Angeles County Department of Public Works, among others.	
Type: Natural Systems Protections	
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.	*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.	*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works	
Type: Education and Awareness Programs	
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.	*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.	*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		*S****evere Wind/Tornado***				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	**Earthquake** **Dam Failure**	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	**Drought**	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	**Drought**	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	**Extreme Heat**	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	**Flooding** **Tsunami**	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	**Mass Violence** **Cyber Incidents**	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	**Mass Violence** **Cyber Incidents**	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	**Mass Violence**	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	**Extreme Heat**	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	**Public Health Emergencies**	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	**Wildfire** **Mass Violence**	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the

incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

F

2025 RUWMP Part 4
GSWC - San Dimas
Appendix F

F1: UWMP Compliance Checklist

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Part 2 Chapter 6 Part 1 Chapter 3
x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Part 2 Chapter 6 Executive Summary
x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Part 2 Chapter 6
x	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Part 2 Chapter 6 Section 2.1
x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Part 2 Chapter 6
x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Part 2 Chapter 6
x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Part 2 Chapter 6 Section 9 Part 4 Appendix F-2
x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Part 4 Appendix F-2
x	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Part 1 Chapter 5
n/a	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	n/a
x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Part 2 Chapter 6 Section 1.1
x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Part 2 Chapter 6 Section 1.1
x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Part 2 Chapter 6 Section 1.1
x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Part 2 Chapter 6 Section 1.1
x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Part 2 Chapter 6 Section 1.1
x	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Part 2 Chapter 6 Section 2
x	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Part 2 Chapter 6 Section 2.1.3
x	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Part 2 Chapter 6 Section 2.1.3
x	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Part 2 Chapter 6 Section 2.3
x	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Part 2 Chapter 6 Section 2.2

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Part 2 Chapter 6 Section 2.2
x	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Part 2 Chapter 6 Section 2
x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Part 2 Chapter 6 Section 2.4 Part 1 Chapter 5
n/a	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	n/a
x	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Part 2 Chapter 6 Section 3
x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Part 2 Chapter 6 Section 4 Part 1 Chapter 3
x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Part 2 Chapter 6 Section 4 Part 2 Chapter 6 Section 5.3 Part 1 Chapter 5 Section 2
x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Part 2 Chapter 6 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Part 2 Chapter 6 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Part 2 Chapter 6 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Part 2 Chapter 6 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Part 2 Chapter 6 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Part 2 Chapter 6 Section 4.2 Part 1 Chapter 3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Part 2 Chapter 6 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Part 2 Chapter 6 Section 4.8
x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Part 2 Chapter 6 Section 4.8 Part 1 Chapter 3 Part 1 Chapter 5
x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Part 2 Chapter 6 Section 4.6
x	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Part 2 Chapter 6 Section 4.5
x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Part 2 Chapter 6 Section 4.5
x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Part 2 Chapter 6 Section 4.5.1
x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Part 2 Chapter 6 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Part 2 Chapter 6 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Part 1 Chapter Section 5
x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Part 1 Chapter 3 Section 8
x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Part 2 Chapter 1 Section 4.7 Part 1 Chapter 3 Section 9
x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Part 2 Chapter 6 Section 4.9 Part 4 Appendix F
x	7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Part 2 Chapter 6 Section 5 Part 1 Chapter 3
x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Part 2 Chapter 6 Section 5.3 Part 1 Chapter 5 Section 2
x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Part 1 Chapter 3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Part 2 Chapter 6 Section 2.4 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Part 2 Chapter 6 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Part 2 Chapter 6 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Part 2 Chapter 6 Section 5.1 Part 1 Chapter 5
x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Part 4 Appendix F-7
x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Part 4 Appendix F-7
x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Part 4 Appendix F-7
x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Part 4 Appendix F-7
x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Part 4 Appendix F-7
x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Part 4 Appendix F-7
x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Part 4 Appendix F-7
x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix F-7

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies*.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought*.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Part 4 Appendix F-7
x	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Part 2 Chapter 6 Section 8
n/a	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	n/a
x	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9
x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Part 2 Chapter 6 Section 9 Part 4 Appendix F-2
x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9
x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix F-3
x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Part 4 Appendix F-3
x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix F-3

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9
x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9
x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9
x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9
x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9
x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9
x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 6 Section 9

F2: Public Outreach

F2: Attachment 1 – 60 Day Notices

Document will be provided upon request through our contact us page.

F2: Attachment 2 – Regional Workshop #1 Materials

Document will be provided upon request through our contact us page.

F2: Attachment 3 – Regional Workshop #2 Materials

Document will be provided upon request through our contact us page.

F3: Adoption Resolution

Notice of Adoption

A meeting to solicit public comments on the 2025 Urban Water Management Plan and 2025 Water Shortage Contingency Plan for the Golden State Water Company San Dimas System was held on May 26, 2026 at 11:00 a.m. via Microsoft Teams Webinar. Notice of this meeting was published in accordance with Section 6066 of the Government Code in the Inland Valley Daily Bulletin on May 12 and May 19, 2026.

Copies of the Urban Water Management Plan and Water Storage Contingency Plan were made available to the public on its website (gswater.com) prior to the public hearing.

Golden State Water Company, hereby, adopts the 2025 Urban Water Management Plan and 2025 Water Shortage Contingency Plan for the San Dimas System.

Patrick M. Kubiak

Digitally signed by Patrick M. Kubiak
Date: 2026.05.28 09:31:19 -07'00'

Patrick Kubiak
Vice President, Asset Management
Golden State Water Company
_____, 2026

F4: Ordinances and Rules

The following ordinances and rules are available online. Select the links below to view:

- Ordinance No. 1240
- Rule No. 14.1 Water Conservation and Reduction Plan
- Schedule No. 14.1 Water Shortage Contingency Plan
- Schedle No. 14.1 SD will be provided on request through our contact us webpage.
- Rule No. 20

F5: DWR Tables

Submittal Table 2-1 Retail: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
CA1910142	GSWC - San Dimas	16,373	10,214
	Total	**16,373**	**10,214**

Submittal Table 2-2: Plan Identification

Type of Plan	Name of Regional Alliance or RUWMP
Individual UWMP	Three Valleys Regional Urban Water Management Plan

Submittal Table 2-3: Supplier Identification

Type of Supplier	Year Type	Month and date that the year begins (mm/dd)	Units of measure used in UWMP
Supplier is a retail supplier	Calendar Year	01/01	AF

Submittal Table 2-4 Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use.
Wholesale Water Supplier Name
Three Valleys Municipal Water District
Covina Valley Water Company

Submittal Table 3-1 Retail: Population - Current and Projected

Category	2025	2030	2035	2040	2045	2050*(opt)*
Population Served	57,511	60,156	62,802	62,992	63,181	63,370

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual

Use Type	Additional Description (as needed)	2025 Actual Water Use Potable or Non-Potable	2025 Actual Water Use Volume (AF)
Single Family		Potable	5,382
Multi-Family		Potable	864
Commercial		Potable	2,555
Landscape		Potable	660
Distribution System Water Loss		Potable	753
		Subtotal Potable	10,214
		Subtotal Non-Potable	0
		Total	**10,214**

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected

Use Type	Additional Description	Projected Water Use Potable or Non-Potable (Optional)	Projected Water Use 2030 (AF)	Projected Water Use 2035 (AF)	Projected Water Use 2040 (AF)	Projected Water Use 2045 (AF)	Projected Water Use 2050 opt (AF)
Single Family		Potable	5,365	5,582	5,549	5,515	5,480
Multi-Family		Potable	856	890	885	880	874
Commercial		Potable	2,550	2,578	2,578	2,579	2,579
Landscape		Potable	561	566	571	575	579
Distribution System Water Loss		Potable	380	383	387	389	392
		Subtotal Potable	9,712	9,999	9,970	9,938	9,904
		Subtotal Non-Potable	0	0	0	0	0
		Total	9,712	9,999	9,970	9,938	9,904

Submittal Table 4-3 Retail: Inclusion in Water Use Projections

Projection Item	Included in Projections?
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included In Projections?	Yes

Submittal Table 4-5 Retail: Water Loss Audit Reporting

Public Water System ID #	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910142	2020	Yes
CA1910142	2021	Yes
CA1910142	2022	Yes
CA1910142	2023	Yes
CA1910142	2024	Yes

Notes: The "Volume of Water Loss" quantities for CY 2020 through CY 2024 were obtained from the annual AWWA Water Loss Audits (and based on the combination of apparent losses and real losses). The AWWA Water Loss Audits were reported on a calendar year basis.

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard

Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System?	Real Water Loss State Water Board Standard 2028 Real Water Loss Standard per Unit per day	Real Water Loss State Water Board Standard Units for Real Water Loss	Real Water Loss Most Recent AWWA Water Loss Audit Number of Units (Connections or Miles corresponding with units selected)	Real Water Loss Most Recent AWWA Water Loss Audit Volume of Total Real Loss (AF) (from AWWA Water Loss Audit)	Real Water Loss Per Unit per Day	Apparent Water Loss State Water Board Standard 2028 Apparent Water Loss Standard per Unit per Day	Apparent Water Loss State Water Board Standard Units for Apparent Water Loss	Apparent Water Loss Most Recent AWWA Water Loss Audit Number of Connections	Apparent Water Loss Most Recent AWWA Water Loss Audit Volume of Total Apparent Loss (AF) (from AWWA Water Loss Audit)	Apparent Water Loss Per Unit per Day
CA1910142	Yes	18.4	Gallons per Service Connection per Day (GPSCD)	16,392	562	30.6	11.3	Gallons per Service Connection per Day (GPSCD)	16,392	171	9.4

Water Board's Calculated Water Loss Standards

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress

Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target?	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Actual 2025 GPCD (From SB X7-7 Compliance Form) *	Did Supplier meet the 2020 Target in 2025? *
n/a	n/a	192	182	Yes	159	Yes

Notes: n/a=Not Applicable

***** Only for suppliers that did not meet the Target in 2020

Submittal Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type	Potable or Non-Potable (OPTIONAL)	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Alluvial Basin	Potable	Main Basin	1,808	2,406	1,315	1,847	2,548
		Total	**1,808**	**2,406**	**1,315**	**1,847**	**2,548**

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area

Wastewater Collection Name of Wastewater Collection Agency	Wastewater Collection Wastewater Volume Metered or Estimated? Optional	Wastewater Collection Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Recipient of Collected Wastewater Name of Wastewater Treatment Plant (WWTP) and Place ID Number	Recipient of Collected Wastewater Is WWTP Located Within UWMP Area?
Sanitation Districts of Los Angeles County	Estimated	3,028	San Jose Creek Water Reclamation Plant, Place ID 260156	No
Sanitation Districts of Los Angeles County	Estimated		A.K. Warren Water Resource Facility, Place ID 234156	No
	Total Wastewater Received from UWMP Service Area in 2025:	**3,028**		

Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (Optional)	2025 Volume of Wastewater Received from UWMP Service Area (AF)	Total 2025 Volume of Water Treated (AF)	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Treatment Level	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Volume (AF)	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Treatment Level	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Treatment Level	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Name of other entity
Total		**0**	**0**		**0**		**0**		**0**		**0**		**0**	

Notes: Wastewater was not treated or disposed of within the UWMP service area; therefore, this table was intentionally left blank.

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

Use Type	Potable or Non-Potable (after treatment if treated) (Optional)	Additional Information	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use Volume	Potential Recycled Water Use Narrative page number (Optional)
		Subtotal Potable	0	0	0	0	0	0	0	
		Subtotal Non-Potable	0	0	0	0	0	0	0	
		Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Notes: Recycled water is currently not used and not planned for use within the service area of the supplier; therefore, this table was intentionally left blank.

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual

Use Type	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Total	**0**	**0**

Notes: Recycled water was not used in 2025 nor previously projected for use in 2020; therefore, this table was intentionally left blank.

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
		Total (AF)	**0**
		Unit Conversion to AF	**0**

Notes: The Supplier does not plan to expand recycled water use in the future; therefore, this table was intentionally left blank, and a narrative explanation is provided in Section 4.5.1 of the UWMP.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other suppliers?	If Yes, Supplier Name	Additional Description	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AF)

Notes: There are future water supply projects or programs not compatible with this table; therefore, are described in narrative form in Section 4.7 of the UWMP**.**

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Description	2025 Potable or Non-Potable (after treatment if treated) (Optional)	2025 Actual Volume (AF)	2025 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Main Basin	Potable	2,548	
Purchased or Imported Water	Covina Valley Water Company	Potable	695	
Purchased or Imported Water	Metropolitan Water District - Three Valley Municipal Water District	Potable	6,786	
Purchased or Imported Water	Walnut Valley Water District	Potable	185	
		Subtotal Potable	10,214	0
		Subtotal Non-Potable	0	0
		Total	**10,214**	**0**

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Projected Water Supply 2030 Reasonably Available Volume (AF)	Projected Water Supply 2030 Total Entitlement (AF) (Optional)	Projected Water Supply 2035 Reasonably Available Volume (AF)	Projected Water Supply 2035 Total Entitlement (AF) (Optional)	Projected Water Supply 2040 Reasonably Available Volume (AF)	Projected Water Supply 2040 Total Entitlement (AF) (Optional)	Projected Water Supply 2045 Reasonably Available Volume (AF)	Projected Water Supply 2045 Total Entitlement (AF) (Optional)	Projected Water Supply 2050 Reasonably Available Volume (AF)	Projected Water Supply 2050 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Main Basin	Potable	1,996		1,970		1,952		1,937		1,921	
Purchased or Imported Water	Metropolitan Water District - Three Valley Municipal Water District	Potable	7,036		7,321		7,310		7,294		7,278	
Purchased or Imported Water	Covina Valley Water Company	Potable	478		497		496		495		494	
Purchased or Imported Water	Walnut Valley Water District	Potable	204		212		211		211		211	
		Subtotal Potable	9,714	0	10,000	0	9,969	0	9,937	0	9,904	0
		Subtotal Non-Potable	0	0	0	0	0	0	0	0	0	0
		Total	**9,714**	**0**	**10,000**	**0**	**9,969**	**0**	**9,937**	**0**	**9,904**	**0**

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year	Volume Available (AF)	Percent of Average Supply
Average Year	2021-2025	10,039	100%
Single-Dry Year	2021	11,280	112%
Consecutive Dry Years 1st Year	2018	10,729	107%
Consecutive Dry Years 2nd Year	2019	9,846	98%
Consecutive Dry Years 3rd Year	2020	10,830	108%
Consecutive Dry Years 4th Year	2021	11,280	112%
Consecutive Dry Years 5th Year	2022	10,763	107%

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	9,713	10,000	9,970	9,937	9,903
Use totals	9,713	10,000	9,970	9,937	9,903
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	10,914	11,237	11,203	11,166	11,128
Use totals	10,914	11,237	11,203	11,166	11,128
Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison

Year	Total Type / Difference	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	10,380	10,687	10,655	10,620	10,584
	Use totals	10,380	10,687	10,655	10,620	10,584
	Difference	**0**	**0**	**0**	**0**	**0**
Second year	Supply totals	9,526	9,808	9,778	9,746	9,712
	Use totals	9,526	9,808	9,778	9,746	9,712
	Difference	**0**	**0**	**0**	**0**	**0**
Third year	Supply totals	10,478	10,788	10,755	10,720	10,683
	Use totals	10,478	10,788	10,755	10,720	10,683
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth year	Supply totals	10,914	11,237	11,203	11,166	11,128
	Use totals	10,914	11,237	11,203	11,166	11,128
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth year	Supply totals	10,413	10,721	10,689	10,653	10,617
	Use totals	10,413	10,721	10,689	10,653	10,617
	Difference	**0**	**0**	**0**	**0**	**0**

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment

Totals	2026	2027	2028	2029	2030
Total Water Use (AF)	10,380	9,526	10,478	10,914	10,413
Total Supplies (AF)	10,380	9,526	10,478	10,914	10,413
Difference w/o WSCP Action (AF)	**0**	**0**	**0**	**0**	**0**

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		

Notes: The Supplier uses the standard six levels of water shortage; therefore, supplier-specific shortage levels and percentage ranges are not separately identified in this table.

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (Percentage)	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)
1	Transfers		Not applicable (see notes)	
2	Transfers		Not applicable (see notes)	
3	Transfers		Not applicable (see notes)	
4	Transfers		Not applicable (see notes)	
5	Transfers		Not applicable (see notes)	
6	Transfers		Not applicable (see notes)	

Notes: GSWC will consider increased production from Six Basins and the Chino Basin using existing facilities to address increased demands. GSWC plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

Submittal Table 8-3 Retail: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 1 actions is up to 984 AFY	Maximum 2 days a week.	Yes
1	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 1 actions is up to 984 AFY	Between 7 p.m. and 8 a.m.	Yes
2	Other	Volume	Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 1,968 AFY	All actions under Shortage Level 1	Yes
2	Implement or Modify Drought Rate Structure or Surcharge	Volume	Collective reduction from all Shortage Level 2 actions is up to 1,968 AFY	All users in excess of allocation will be charged regular rate + $2.50/CCF	Yes
3	Other	Volume	Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 2,952 AFY	All actions under Shortage Level 2	Yes
4	Other	Volume	Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 3,936 AFY	All actions under Shortage Level 3	Yes
4	Implement or Modify Drought Rate Structure or Surcharge	Volume	Collective reduction from all Shortage Level 4 actions is up to 3,936 AFY	All actions under Shortage Level 4	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
5	Other	Volume	Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 4,920 AFY	All actions under Shortage Level 5	Yes
6	Other	Volume	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 4,920 AFY	All actions under Shortage Level 5	Yes
6	Implement or Modify Drought Rate Structure or Surcharge	Volume	Collective reduction from Shortage Level 6 actions is greater than 4,920 AFY	All use in excess of allocation will be charged regular rate + $1.00/CCF	Yes

Submittal Table 10-1 Retail: Notification to Cities and Counties

City or County Name	60 Day Notice	Notice of Public Hearing
Covina	Yes	Yes
Glendora	Yes	Yes
La Verne	Yes	Yes
San Dimas	Yes	Yes
Walnut	Yes	Yes
Los Angeles County	Yes	Yes

F6: AWWA Water Audits

The following AWWA Water Audit reports are available online. Select the links below to view each report:

- 2020 AWWA Water Audit
- 2021 AWWA Water Audit
- 2022 AWWA Water Audit
- 2023 AWWA Water Audit
- 2024 AWWA Water Audit

If a link is not available, AWWA Water Audit reports for all years can be downloaded from the WUEdata website.

F7: Water Shortage Contingency Plan

F7: Attachment 1 – Water Shortage Contingency Plan Adoption Resolution

Notice of Adoption

A meeting to solicit public comments on the 2025 Urban Water Management Plan and 2025 Water Shortage Contingency Plan for the Golden State Water Company San Dimas System was held on May 26, 2026 at 11:00 a.m. via Microsoft Teams Webinar. Notice of this meeting was published in accordance with Section 6066 of the Government Code in the Inland Valley Daily Bulletin on May 12 and May 19, 2026.

Copies of the Urban Water Management Plan and Water Storage Contingency Plan were made available to the public on its website (gswater.com) prior to the public hearing.

Golden State Water Company, hereby, adopts the 2025 Urban Water Management Plan and 2025 Water Shortage Contingency Plan for the San Dimas System.

Patrick M. Kubiak

Digitally signed by Patrick M. Kubiak
Date: 2026.05.28 09:31:19 -07'00'

Patrick Kubiak
Vice President, Asset Management
Golden State Water Company
_____, 2026

F7: Attachment 2 – Water Shortage Contingency Plan

2025 WATER SHORTAGE CONTINGENCY PLAN

GOLDEN STATE WATER COMPANY – SAN DIMAS

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AF	Acre-Foot
AFY	Acre-Feet per Year
CCF	Hundred Cubic Feet
CPUC	California Public Utilities Commission
CVWC	Covina Valley Water Company
CWC	California Water Code
DMM	Demand Management Measure
DWA	Division of Water and Audits
DWR	California Department of Water Resources
ERP	Emergency Response Plan
FY	Fiscal Year
GSWC	Golden State Water Company
MWD	Metropolitan Water District of Southern California
RRA	Risk and Resilience Assessment
TVMWD	Three Valleys Municipal Water District
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WVWD	Walnut Valley Water District

WATER SHORTAGE CONTINGENCY PLAN

LAY DESCRIPTION

WATER SHORTAGE CONTINGENCY PLAN

Golden State Water Company – San Dimas' (GSWC) 2025 Water Shortage Contingency Plan (WSCP) discusses and provides the following:

- GSWC's WSCP is a detailed approach which presents how GSWC intends to act, or respond, in the case of an actual water shortage.
- Preparation of GSWC's "Annual Water Supply and Demand Assessment" (Annual Assessment) is discussed. Beginning July 1, 2022, GSWC has submitted the Annual Assessment each year through 2025. The Annual Assessment includes a review of GSWC's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent GSWC's water demands prior to any "response actions" GSWC may invoke pursuant to GSWC's WSCP.
- GSWC will manage water supplies to minimize the adverse impacts of water shortages. GSWC's plan for water usage during periods of shortage is designed to incorporate six standard and progressive water shortage levels including up to a 10, 20, 30, 40, and 50 percent shortage, and greater than a 50 percent shortage.
- For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level.
- For each declared water supply shortage level, GSWC has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.

- The operational changes GSWC will consider in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- GSWC's Emergency Response Plan (ERP) is summarized. The ERP provides the management, procedures, and designated actions GSWC and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of GSWC's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of GSWC's water service area are provided.
- The effectiveness of the shortage response actions for each of GSWC's standard water shortage levels is presented. GSWC has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands.
- The communication protocols implemented by GSWC when it declares any water shortage level are presented.
- The compliance and enforcement procedures associated with GSWC's standard water shortage levels are presented.
- The legal authorities associated with GSWC's standard water shortage levels are presented.
- The financial consequences associated with GSWC's standard water shortage levels are presented.
- GSWC will evaluate the need for revising the WSCP to resolve any water shortage gaps, as necessary. The steps necessary for GSWC to adopt and amend its WSCP are presented.

The following WSCP includes references to Chapters and Sections from GSWC's 2025 Urban Water Management Plan (UWMP):

1 WATER SUPPLY RELIABILITY ANALYSIS

CWC 10632.

(a)(1) The analysis of water supply reliability conducted pursuant to Section 10635.

GSWC's sources of supply were discussed in Chapter 4 of the 2025 UWMP and consist of groundwater from Main San Gabriel Basin (Main Basin), purchased water from Covina Valley Water Company (CVWC) and Walnut Valley Water District (WVWD), local surface water from San Dimas Canyon Creek, and treated imported water purchased from the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD). The Main Basin is adjudicated and groundwater supplies are managed. The reliability of the various sources of supply are discussed in Chapter 5 of the UWMP. Based on the adjudication provisions in the Main Basin, GSWC is able to produce groundwater without limitation, provided an applicable assessment is paid to the Main Basin Watermaster to purchase untreated imported water for groundwater replenishment. Imported water supplies (both treated and untreated) may be impacted in the event MWD implements its Water Supply Allocation Plan (WSAP) due to a water supply shortage.

2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

CWC 10632.

(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

CWC 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

Beginning July 1, 2022, GSWC has submitted an "Annual Water Supply and Demand Assessment" (Annual Assessment) in accordance with California's Department of Water Resources' (DWR) guidance and requirements. The Annual Assessment includes a

review of GSWC's unconstrained water demands (i.e., water demands prior to any projected response actions GSWC may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. GSWC also includes information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the GSWC's WSCP.

For each Annual Assessment, GSWC prepares a preliminary assessment which evaluates the adequacy of its water supplies for the current and upcoming years by April of each year. The preliminary assessment includes a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

2.1 DECISION MAKING PROCESS

GSWC produces groundwater from the Main Basin and purchases treated imported water as its primary sources of water supply. The Main Basin is managed on a fiscal year basis. Consequently, during the third quarter of each fiscal year, GSWC reviews its water demands from the initial six months along with the current groundwater basin conditions, local hydrology and imported water supply outlook. This information is used to help develop the Annual Assessment. A draft of the Annual Assessment is circulated internally within GSWC for peer review and comment. Based on comments received, a redraft is prepared and provided to GSWC managers during the spring of each year. The draft is then provided to the General Manager for final review. Subsequently, a final draft of the Annual Assessment is provided to GSWC's Board of Directors for review and included in the agenda as part of a Board meeting such that it can be approved and any recommended specific shortage response actions may be enacted. The final Annual Assessment is provided to DWR no later than July 1 of each year.

The Annual Assessments are instrumental in providing guidance to GSWC for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process ensures adequate water supplies resources are available to GSWC.

2.2 DATA AND METHODOLOGIES

The key data inputs and methodologies which are evaluated by GSWC during the preparation of the preliminary assessment include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment are identified. The evaluation criteria includes, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels), current water demands, a review of water system improvement plans which may impact infrastructure availability, and water quality regulations which may impact groundwater availability. GSWC compares total demand to total supply to identify potential shortages. If shortages are identified, GSWC will determine the necessary WSCP level and corresponding reduction.

2) Water Supply: A description and available volume of each available water supply source is provided. The description includes a quantification of each available water supply source and is based on review of current production capacities, historical production, UWMPs, and prior water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year, prior to any special shortage actions, are reviewed and calculated as necessary. The review includes factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban Water Supplier

Reports, existing water shortage levels (see Section 3), and existing water conservation ordinances (see Section 8.1.1 of the UWMP).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands during the current year and the upcoming (potential single dry) year are considered and identified for each source of supply The evaluation includes factors such as estimated water demands, weather, groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.

5) Infrastructure Considerations: The capabilities of the water distribution system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year are considered. Available production capacities (e.g. groundwater well capacities) and distribution system water losses (see UWMP Section 2.1.2) are reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see UWMP Section 4.7), are considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies are described.

3 SIX STANDARD WATER SHORTAGE LEVELS

CWC 10632.

(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph

(A) by developing and including a cross reference relating its existing categories to the six standard water shortage levels.

GSWC will manage water supplies prudently to minimize the adverse impacts of water shortages. GSWC's plan for water usage during periods of shortage is designed to incorporate six standard water shortage levels corresponding to progressive ranges from up to a 10, 20, 30, 40, and 50 percent shortages, and greater than a 50 percent shortage.

For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level. GSWC will identify the year to be used for establishing the customer baseline water use.

California Public Utilities Commission's (CPUC) Rule No. 14.1 ("Water Conservation and Rationing Plan"), adopted on November 3, 2022, and Schedule No. 14.1 ("Water Shortage Contingency Plan With Staged Mandatory Reductions And Drought Surcharges"), adopted on March 1, 2025 established six (6) water shortage levels. A copy of Rule No. 14.1 and Schedule No.14.1 is provided in Appendix A. In accordance with the CWC in which urban water suppliers are required to define six standard water shortage levels, GSWC updated its Schedule No. 14.1 to reflect the mandated shortage levels.

GSWC's 2025 Mandated Shortage Levels

2025 Standard Level	Shortage Level
1	< 10%
2	10 to 20%
3	20 to 30%
4	30 to 40%
5	20 to 50%
6	>50 %

Note: The 2020 shortage levels have remained the same for 2025.

Table 1 provides a description of the six water shortage levels, which may be triggered by a shortage in one or more of GSWC's water supply sources, depending on the severity of the shortage and its anticipated duration.

Table 1. Water Shortage Contingency Planning Levels

Submittal Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions (*Narrative description*)**
1	Up to 10%	"Water Alert" – Voluntary conservation is encouraged. GSWC Implements voluntary conservation measures authorized under Rule No. 14.1. Establishes a voluntary demand reduction target for each water system. GSWC informs public of water shortage conditions or demand reduction targets, GSWC identifies the year to be used for establishing the customer baseline water use. Recommend voluntary 3-Day outdoor irrigation between the hours of 7 PM and 8 AM per specified schedule. GSWC may change the number of watering days and the specific days of watering after notification in accordance with CPUC Rule 14.1.
2	Up to 20%	20% Mandatory Reduction Stage – "Moderate Shortage" - In addition to all actions in Shortage Level 1, Outdoor irrigation is restricted to two (2) days per week per established schedule. GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 20%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $2.50 per CCF Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.
3	Up to 30%	30% Mandatory Reduction Stage – "Severe Shortage" - In addition to actions in Shortage Level 2, GSWC calculates customer conservation allocation based upon year identified in Stage 1, less 30%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $5.00 per CCF. Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.
4	Up to 40%	40% Mandatory Reduction Stage – "Critical Shortage" - In addition to actions in Shortage Level 3, GSWC calculates customer conservation allocation based upon year identified in Stage 1, less 40%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $7.50 per CCF. Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.

Submittal Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions (*Narrative description*)**
5	Up to 50%	50% Mandatory Reduction Stage – "Shortage Crisis" - In addition to actions in Shortage Level 4, GSWC calculates customer conservation allocation based upon year identified in Stage 1, less 50%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $10.00 per CCF. Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.
6	>50%	55% Mandatory Reduction Stage – "Emergency Shortage" - In addition to actions in Shortage Level 5, GSWC calculates customer conservation allocation based upon year identified in Stage 1, less 55%. For residential customers no allocation will be less than 8 CCF/monthly billing period or 16 CCF/bi-monthly billing period unless directed otherwise by an authorized government agency. Water usage in excess of customer baseline may be charged regular rate plus drought emergency surcharge of up to $15.00 per CCF. Installation of a flow restrictor for repeated violation of water use restrictions under Rule No, 14.1, C.3, as noted in Section C. of Schedule No. 14.1.

NOTES: Flow Restrictor Charges – The charge for installation and removal of a flow-restricting device shall be:
5/8" to 1" - $150
1-1/2" to 2" $200
3" and larger - $300

4 SHORTAGE RESPONSE ACTIONS

CWC 10632.

(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

Shortage response actions are dependent on the severity of a declared shortage level. Response actions implement varying improvements and regulations of system infrastructure and operations, water supply augmentation, demand reduction initiatives and other water use functions to conserve water supplies.

GSWC is an investor-owned supplier and is subject to the approval by CPUC to establish and activate necessary shortage response actions and corresponding water shortage levels pursuant to CPUC Rule No. 14.1 (“Water Conservation and Rationing Plan”). GSWC may express a need for customers to practice voluntary or mandatory conservation measures. If GSWC finds it necessary, GSWC may request to activate a water shortage level which would implement fines and surcharges in addition to mandatory conservation measures after establishing a CPUC Schedule No. 14.1 (“Water Shortage Contingency Plan With Staged Mandatory Restrictions, Reductions And Drought Surcharges ”). Copies of these CPUC documents are found in Appendix A.

4.1 DEMAND REDUCTION

GSWC may establish water shortage response actions to reduce demand on water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions. Depending on the percent reduction in GSWC's water supply and corresponding water shortage level, regulations are made to conserve water and reduce the shortage gap in normal supply levels. Many demand reduction actions, identified as voluntary or mandatory conservation measures, are applicable to all levels of water shortages. The structure of water shortage levels are designed to encourage customers with high gallon per capita usage to achieve proportionally greater reduction than those with low usage. Violations of these demand reduction actions may be considered waste and an unreasonable use of water. Table 2 describes each demand reduction action and its effect on reducing the shortage gap.

The following demand reduction actions may be activated under voluntary or mandatory conservation measures and are applicable, and in effect, at all times during any activated water shortage level:

a. The application of potable water to outdoor landscapes in a manner that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.

b. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

c. The use of potable water for washing buildings, structures, sidewalks, walkways, patios, tennis courts, or other hard-surfaced, non-porous areas.

d. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.

e. The use of potable water for watering outside plants, lawn, landscape, and turf

area during certain hours prohibited by applicable laws or rules, during and up to 48 hours after measurable rainfall (0.1" or more).

f. GSWC will promptly notify customers when aware of leaks within the customer's control; the failure to repair any leaks, breaks, or other malfunction resulting in water waste in a customer's domestic or outdoor water system within forty-eight (48) hours of notification by the utility, unless other, specific arrangements are made with and agreed to by the utility.

g. The serving of water, other than upon request, in eating and drinking establishments, including but not limited to restaurants, hotels, cafes, bars, or other public places where food or drink are served and/or purchased.

h. Hotels/motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.

i. The use of potable water for irrigation of ornamental turf on public street medians.

j. The use of potable water for irrigation outside of newly constructed homes and buildings that is not delivered by drip or micro spray systems.

k. Commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water use in an amount consistent with the mandated reduction.

l. Further reduction in or the complete prohibition of any other use of water declared non-essential, unauthorized, prohibited, or unlawful by an authorized government or regulatory agency or official.

m. Use of potable water for watering streets with trucks, or other vehicles, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.

n. The outdoor irrigation restriction does not apply to trees or edible vegetation

watered solely by drip or micro spray systems.

o. The use of potable water is prohibited for the irrigation of non-functional turf at commercial, industrial and institutional sites.

- Use of potable water for more than minimal landscaping, as defined in the landscaping regulation of the jurisdiction or as described in Article 10.8 of the California Government Code in connection with new construction.
- Excessive use of water when a utility has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering, or irrigation system and the customer has failed to make such repairs within five (5) business days.
- Use of potable water which results in flooding or runoff in gutters or streets.
- Individual private washing of cars with a hose except with the use of a positive action shut-off nozzle. Use of potable water for washing commercial aircraft, cars, buses, boats, trailers, or other commercial vehicles at any time, except at commercial or fleet vehicle or boat washing facilities operated at a fixed location where equipment using water is properly maintained to avoid wasteful use.
- Use of potable water to wash buildings, structures, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas, except in the cases where health and safety are at risk.
- Use of potable water to irrigate turf lawns, gardens, or ornamental landscaping by means other than drip irrigation, or hand watering without quick acting positive action shut-off nozzles, on a specific schedule, for example: 1) between 7 p.m. and 8 a.m.; 2) every other day; or 3) selected days of the week.
- Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
- Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

- Use of potable water for construction purposes unless no other source of water or method can be used.
- Use of potable water for street cleaning.
- Operation of commercial car washes must ensure that at least 50 percent of the potable water used per cycle is recycled.
- Use of potable water for watering outside plants, lawn, landscape, and turf areas during certain hours if and when specified in Schedule 14.1-SD.
- Use of potable water for decorative fountains or the filling or topping off of decorative lakes or ponds which utilize recycled water.
- Serving water in any restaurant except upon the request of a patron.
- Use of potable water to flush hydrants, except where required for public health or safety.

Stage 1 – Voluntary Conservation "Water Alert" :

Recommended voluntary outdoor irrigation – Three (3) days per week:

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Sunday, Wednesday, Friday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday, Thursday, Saturday

Additional actions:

- GSWC will establish a voluntary demand reduction target for each water system.
- All outdoor irrigation must occur between the hours of 7 p.m. and 8 a.m.
- If a city, county, or other public agency adopts restrictions on the number of days or hours of the day that customers may irrigate, GSWC, at its discretion, may adopt and enforce those restrictions.

If conditions warrant, GSWC will change the number of watering days and the specific days of watering after first notifying its customers in accordance with Rule 14.1.

Stage 2 – 20% Mandatory Reduction Stage "Moderate Shortage"

In addition to the restrictions identified in Stage 1 Voluntary Conservation "Water Alert", the following allocations and drought emergency surcharges are in effect:

- Outdoor Irrigation is restricted to two (2) days per week based on the irrigation schedule set in Schedule 14.1.
- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 20%
- For residential customers, no allocation will be set less than eight hundred cubic feet (8 CCF) per monthly billing period or sixteen (16) CCF per bi-monthly billing period.
- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $2.50 per CCF.

Stage 3 – 30% Mandatory Reduction Stage "Severe Shortage":

In addition to the restrictions identified in Stage 2 – 20% Mandatory Reduction Stage "Moderate Shortage", the following allocations and drought emergency surcharges are in effect:

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 30%
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency.
- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $5.00 per CCF

Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C of Schedule 14.1.Stage 4 – 40% Mandatory Reduction Stage "Critical Shortage"

In addition to the restrictions identified in Stage 3 - 30% Mandatory Reduction Stage "Severe Shortage", the following allocations and drought emergency surcharges are in effect:

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 40%
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency.
- No allocation will be set less than eight (8) CCF per monthly billing period or sixteen (16) CCF per bi-monthly billing period
- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $7.50 per CCF.

Installation of a flow restrictor for repeated violation of water use restrictions under Rule

14.1 C.3., as noted in Section C of Schedule 14.1.Stage 5 – 50% Mandatory Reduction Stage "Shortage Crisis"

In addition to the restrictions identified in Stage 4 – 40% Mandatory Reduction Stage "Critical Shortage", the following allocations and drought emergency surcharges are in effect:

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 50%
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency.
- No allocation will be set less than eight (8) CCF per monthly billing period or sixteen (16) CCF per bi-monthly billing period.
- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $10.00 per CCF

Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C of Schedule 14.1.Stage 6 – 55% Mandatory Reduction Stage "Emergency Shortage":

In addition to the restrictions identified in Stage 5 – 50% Mandatory Reduction Stage "Shortage Crisis", the following allocations and drought emergency surcharges are in effect:

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1 less 55%
- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency.
- No allocation will be set less than eight (8) CCF per monthly billing period or sixteen (16) CCF per bi-monthly billing period

- All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $15.00 per CCF.
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C of Schedule 14.1.

Table 2. Demand Reduction Actions

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 1 actions is up to 984 AFY	Maximum 2 days a week.	Yes
1	Landscape - Limit landscape irrigation to specific times	Collective reduction from all Shortage Level 1 actions is up to 984 AFY	between 7 p.m. and 8 a.m.	Yes
2	Other	Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 1,968 AFY	All actions under Shortage Level 1	Yes
2	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 2 actions is up to 1,968 AFY	All users in excess of allocation will be charged regular rate + $2.50/CCF	Yes
3	Other	Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 2,952 AFY	All actions under Shortage Level 2	Yes
4	Other	Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 3,936 AFY	All actions under Shortage Level 3	Yes
4	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 4 actions is up to 3,936 AFY	All actions under Shortage Level 4	Yes
5	Other	Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 4,920 AFY	All actions under Shortage Level 5	Yes
6	Other	Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 4,920 AFY	All actions under Shortage Level 5	Yes
6	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from Shortage Level 6 actions is greater than 4,920 AFY	All use in excess of allocation will be charged regular rate + $1.00/CCF	Yes

NOTES:

4.2 SUPPLY AUGMENTATION

GSWC does not plan to add a new source of water supply to address customer demands, but instead will consider increased supplies from existing sources. Table 3 reflects this approach and does not identify any new supplies. Instead, GSWC will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. As discussed in Chapter 4 of the UWMP, GSWC's sources of water supply include groundwater produced from the Main Basin and treated imported water purchased from MWD through TVMWD. As noted in Section 2, beginning July 1, 2022, GSWC has prepared and submitted an Annual Assessment which includes a review of water supplies available to meet water demands for the current and upcoming years. In the event GSWC is currently in, or considers entering into, one of the standard water shortage levels identified in Section 3, GSWC will consider the water supply (augmentation) actions described below.

For each water shortage level discussed in Section 3, GSWC will consider supplementing its existing treated imported water supplies through increased production of groundwater supplies, to the extent possible. Due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies, including TVMWD. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its M&I retail demand. The ratio of MWD water supply drought allocation to local water supply will change based on the WSAP stage. The MWD drought allocation can be used to make Full Service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any Full Service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

In addition to the WSAP, MWD describes supply augmentation actions in its Regional 2025 UWMP, which is incorporated by reference. MWD's primary first response to any gap between core supplies (from the State Water Project and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing

from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million acre-feet (AF). Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and on-going water supply and storage programs and management practices, GSWC will use up to the treated imported water supply made available from MWD through TVMWD in association with each of the standard water shortage levels identified in Section 3. Water demands will be addressed through increased use of the local groundwater supplies and implementation of demand reduction measures through various stages of action.

GSWC will consider augmenting its existing water supplies through production of additional groundwater from the Main Basin. As noted in Section 4.2 of the UWMP, the Main Basin is managed by the Main Basin Watermaster. During the period of management under the Main Basin Judgment, significant drought events have occurred. In each drought cycle the Main Basin has been managed to maintain water levels. Parties to the Main Basin Judgment, including GSWC, are authorized to produce groundwater in excess of their rights and pay assessments for such production to the Main Basin Watermaster. The assessments are used to purchase untreated imported water to replenish the Main Basin. The Main Basin Watermaster purchases untreated imported water to replenish the Main Basin from MWD through TVMWD. Groundwater quality is carefully monitored and managed by the Main Basin Watermaster. Treatment facilities and/or blend plans have been developed by water agencies to meet potable water standards and to prevent the spread of any groundwater contamination. Groundwater quality in the Main Basin is not expected to impact potable supplies or constrain supply reliability. Based on historical and on-going management practices, GSWC will be able to continue relying on the Main Basin for adequate supplies in response to each of the

standard water shortage levels identified in Section 3.

Table 3. Supply Augmentation and Other Actions

Submittal Table 8-2: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Transfers	Not applicable (see Notes)	
2	Transfers	Not applicable (see Notes)	
3	Transfers	Not applicable (see Notes)	
4	Transfers	Not applicable (see Notes)	
5	Transfers	Not applicable (see Notes)	
6	Transfers	Not applicable (see Notes)	

NOTES: GSWC will consider increased production from the Main Basin using existing facilities to address increased demands. As noted on Table 2, GSWC plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

4.3 OPERATIONAL CHANGES

During a water supply shortage situation, GSWC will manage its water supply resources to provide sufficient water supplies capable of meeting the demands of its customers. Section 4.2 describes GSWC's water supply sources and water supply augmentation actions available. Section 4.1 describes GSWC's standard water shortage levels and associated demand reduction measures. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in short-term operational changes which are necessary to allow GSWC to utilize all available water supply sources in response to water shortage situations.

As noted in Section 2, beginning July 1, 2022, GSWC has prepared and submitted an Annual Assessment which includes a review of the water supplies available to meet water demands for the current and upcoming years. Preparation of the Annual Assessment assists GSWC in determining any potential operational changes. In addition, GSWC's standard water shortage levels and the associated demand reduction measures, in conjunction with GSWC's existing Demand Management Measures (DMM) (discussed in Chapter 8 of the UWMP), will be essential to GSWC in reducing water demands during any water shortage period. The operational changes GSWC will consider in addressing

non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- Optimized production from existing available water supply sources.
- Potential use of emergency supply sources, including emergency interconnections.
- Potential blending of water supply resources.
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses.

4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by GSWC to reduce customer demands are discussed in Section 4.1. There are no additional mandatory restrictions planned at this time.

4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in GSWC's standard water shortage levels (identified in Section 3) and the associated demand reduction measures (described in Section 4.1). In addition to the water supply augmentation actions (Section 4.2) and potential operational changes (Section 4.3) which GSWC may consider in order to continue providing sufficient water supplies, GSWC will review and implement any necessary steps included in its ERP.

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including GSWC, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated ERP every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States Environmental Protection Agency, confirming the current RRA and ERP have been reviewed and updated. For GSWC, the RRA certification was due by December 31, 2025,

and the ERP certification is due by December 31, 2026.

GSWC's RRA evaluates the vulnerabilities, threats, and consequences from potential hazards to GSWC's water system. GSWC prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and
- Operation and maintenance.

GSWC's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with GSWC's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

GSWC's ERP, which is currently being reviewed and updated, provides the management, procedures, and designated actions GSWC and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances. GSWC's ERP (which is incorporated by reference) provides the guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies which directly affect the water system and the ability to maintain safe operations (such as a chlorine release, and earthquake, or a threat of contamination). The ERP also incorporates the results of GSWC's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity.
- Plans and procedures for responding to a natural hazard or malevolent act.
- Actions and equipment to lessen the impact of a natural hazard or malevolent act.
- Strategies to detect natural hazards or malevolent act.

GSWC will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. GSWC will also review applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC 10632.5.

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

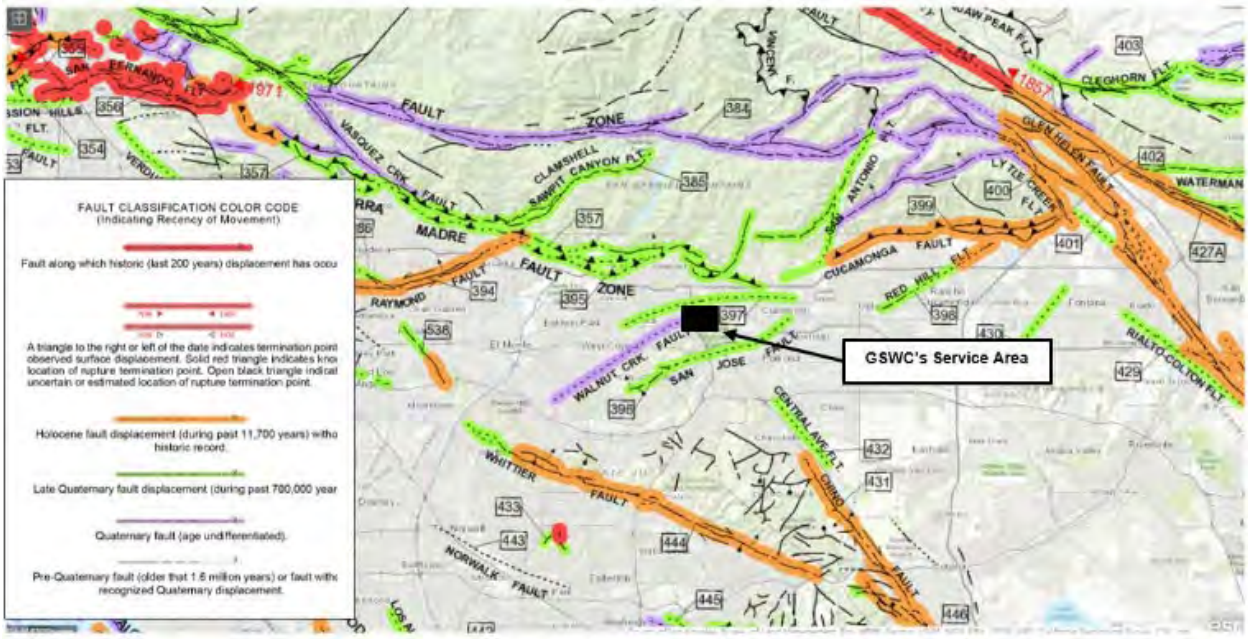
(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

The County of Los Angeles prepared a “All-Hazards Mitigation Plan” in 2025 which identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Los Angeles County, and the mitigation strategies necessary to reduce risks, including seismic risk The County’s “All-Hazards Mitigation Plan” is provided in Appendix B.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of GSWC's water service area are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in GSWC's water service area include the San Andreas fault, the Walnut Creek fault, the San Jose fault, the Red Hill fault, the Raymond fault, the Cucamonga fault, and the Sierra Madre fault.

Location of Earthquake Faults

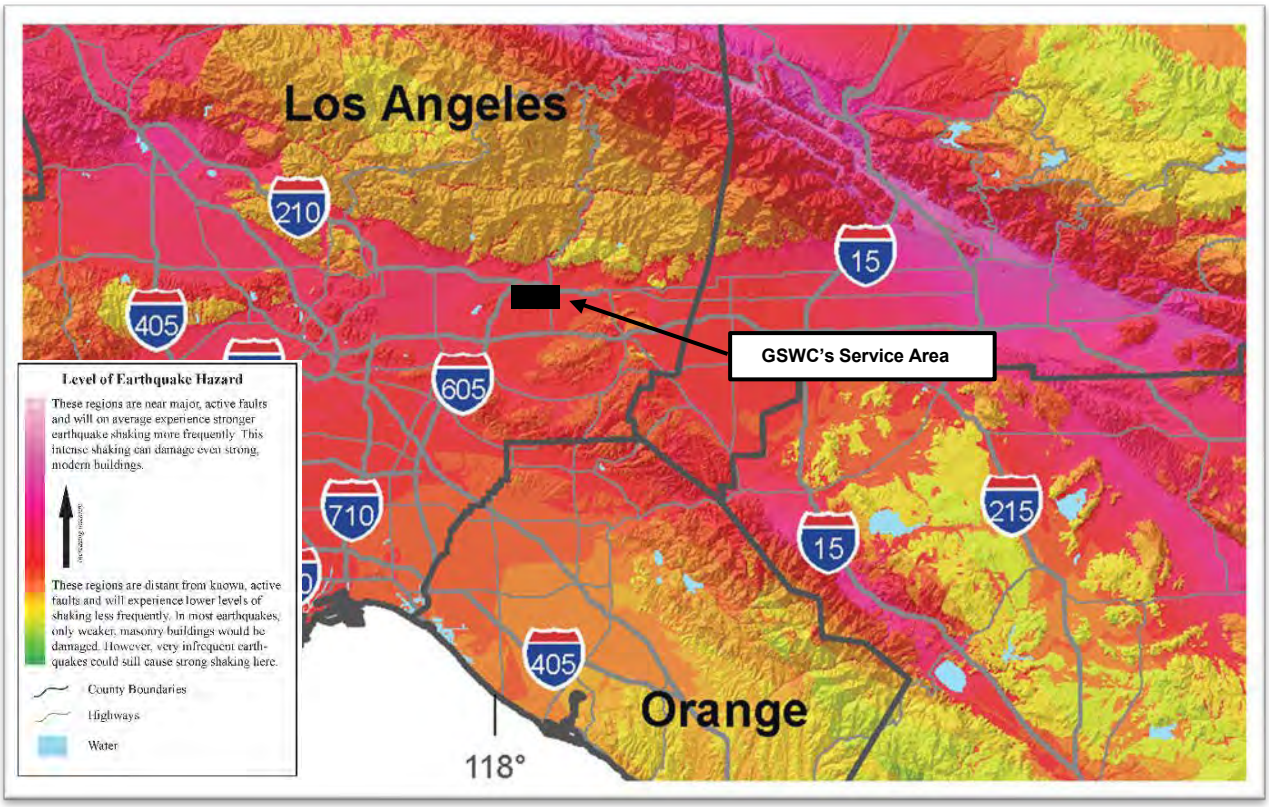


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of GSWC's service area from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including GSWC's service area, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section

4.5, GSWC is preparing an ERP which provides the management, procedures, and designated actions GSWC and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers receive a reliable and adequate supply of potable water. GSWC's ERP is incorporated by reference.

Earthquake Shaking Potential



Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 3 is evident in GSWC's historical ability to meet its customer's water demands in response to a water supply shortage. In addition, GSWC imposes water consumption regulations and restrictions, and supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of

GSWC's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3.

During the past 5 years, GSWC experienced a consecutive two-year drought within its service area from FY 2021 to FY 2022. Throughout this extended dry year period, the GSWC's annual water production averaged 11,022 acre-feet per year (AFY). During the past five years, the average annual production was approximately 10,039 AFY, with a maximum of 11,280 AF during FY 2021. GSWC has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, GSWC has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

GSWC's water demands during the most recent four years averaged approximately 9,098 AFY of potable water. Due to conservation efforts and demand management measures (discussed in Chapter 8 of the UWMP), GSWC's recent water demands have been less than its historical water demands, including during long-term droughts. GSWC's projected water demands (during a normal year, a single dry year, and a five consecutive year drought) are provided in Section 5.3 of the UWMP and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. It is anticipated GSWC will be able to continue providing sufficient water supplies to its customers to meet projected water demands, including during long-term droughts. In addition, as discussed in Section 4.2, based on historical and on-going management practices, GSWC will be able to continue relying on its water supply sources from the Main Basin and treated imported water for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 3.

GSWC previously adopted Schedule 14.1-SD in June 2015 which declared a water supply shortage and established water-use restrictions and regulations equivalent to the standard water shortage level 1 identified in Section 3. During this Level 1 water shortage period, GSWC was able to reduce water demands by up to 10 percent and provide

sufficient water supplies to its customers. Copies of Schedule 14.1-SD are provided in Appendix A.

Based on GSWC's demonstrated ability to meet water demands during past water supply shortages, the adopted water shortage levels, the adjusted operating safe yields, and water supplies during long-term droughts, it is anticipated that GSWC will be able to provide sufficient water supplies to its customers during each of its standard water shortage levels. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. GSWC will enact varying levels of its WSCP to encourage retail customers to reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of GSWC's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction section provided in Table 2 and Table 3. The effectiveness of GSWC's shortage response actions is based on GSWC's water demands prior to 2015 (unconstrained demands). GSWC reduced its water demands in 2015 in response to the Governor's April 1, 2015 Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. GSWC's actual water demand reduction during this period was used to estimate the extent of water use reductions for GSWC's Water Shortage Stages. GSWC's Water Shortage Levels 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

5 COMMUNICATION PROTOCOLS

CWC 10632.

(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Since July 1, 2022, GSWC has submitted an "Annual Water Supply and Demand Assessment" (Annual Assessment) in accordance with DWR's guidance and requirements. The Annual Assessment includes a review of GSWC's unconstrained water demands (i.e. water demands prior to any projected response actions GSWC may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. GSWC also includes information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with GSWC's WSCP. See Section 2 for further discussion of the Annual Assessment.

GSWC may elect to activate voluntary conservation pursuant to CPUC's Rule 14.1, described in Section 4., by notifying the Director of the CPUC's Division of Water and Audits (DWA). GSWC will notify customers through a bill insert or direct mailing.

GSWC may elect to establish mandatory conservation measures and standard water shortage levels by requesting the addition of a Schedule 14.1-SD tariff, via a Tier 2 advice letter to CPUC. Upon approval of establishing Schedule 14.1-SD, GSWC may then request activation of a water shortage level through a Tier 2 advice letter to CPUC, if necessary. GSWC also may request a loss revenue memorandum account at this time.

The Tier 2 advice letter to establish Schedule 14.1-SD includes but is not limited to:

- Applicability,
- Territory applicable to,
- A detailed description of each water shortage level,
- A detailed description of the trigger that activates each water shortage level,
- A detailed description of each water use restriction for each water shortage level,
- Water use violation levels, written warning levels, associated fines, if applicable, and exception procedures.
- Conditions for installation of a flow restrictor,

- Charges for removal of flow restrictors, and
- Special conditions.

The Tier 2 advice letter requesting activation of Schedule 14.1-SD will include, but not be limited to, justification for activating a particular water shortage level and the period during which the water shortage level will be in effect. GSWC must consult with CPUC DWA staff prior to filing the advice letter in order to determine details of the public meeting. GSWC shall then notify the customer of each Tier 2 advice letter filed with CPUC and details of the associated CPUC public hearing by bill inserts or direct mailing.

Upon approval, GSWC shall notify its customers of the activation of a water shortage level by means of bill inserts or direct mailing. Notification shall take place prior to imposing any fines associated with the activated water shortage level. If activation of a water shortage level by Schedule 14.1-SD would occur one year or more since the public hearing associated with establishing Schedule 14.1-SD, then GSWC shall conduct a public hearing prior to activation of the water shortage level. GSWC shall provide its customers with updates in at least every other bill regarding its water supply status and the results of the customers' conservation efforts.

Under unique circumstances where a specific requirement of this WSCP would result in undue hardship to a customer that is disproportionate to the impacts on other customers, then the customer may apply for an exemption or appeal by completing an Appeals form available online at GSWC's website or the GSWC office. GSWC shall respond to each request in writing.

6 COMPLIANCE AND ENFORCEMENT

CWC 10632.

(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

Any violation of this WSCP is considered a waste and an unreasonable use of water. In the event a customer is observed to be using water for any nonessential or unauthorized use as defined by this WSCP, GSWC may charge a water use violation fine in accordance with Schedule 14.1-SD

GSWC may, after one written warning, install a flow restricting device on the service line of any customer observed by GSWC personnel to be using water in violation of the WSCP. A flow-restricting device shall not restrict water delivery by greater than 50 percent of normal flow and shall be capable of providing the property with a minimum of 3 CCF/person/month. The restricting device may be removed only by GSWC staff, after a three-day period has elapsed, and upon payment of the appropriate removal charge as set forth in Schedule 14.1-SD.

After removal of the restricting device, if any nonessential or unauthorized use of water continues, GSWC may install another flow restricting device without written notice. This device shall remain in place until water supply conditions warrant its removal and until the appropriate charge for removal has been paid to GSWC.

Any tampering with a flow restricting device by a customer can result in discontinuation of water use at GSWC's discretion.

7 LEGAL AUTHORITIES

CWC 10632.

(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

CWC Division 1, Section 350

The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

GSWC is an investor-owned Supplier and is subject to CPUC approval to establish and/or activate necessary shortage response actions and corresponding water shortage levels, pursuant to CPUC Rule 14.1. GSWC is responsible for implementing and enforcing the water shortage response actions. GSWC may update current water shortage condition response measures based on CPUC approvals and direction, state policy directives, emergency conditions, or to improve customer response.

GSWC may declare a water shortage emergency and implement any shortage response action deemed necessary, upon CPUC approval. Upon declaration of a water shortage emergency, GSWC shall coordinate with the local cities and counties within their service area for the possible proclamation of a local emergency. This includes the Cities of San Dimas, Covina, La Verne, and Walnut, and the County of Los Angeles.

GSWC shall declare a water shortage emergency in accordance with CA Water Code CHAPTER 3 - Water Shortage Emergencies § 350 – 358. Legal authorities include California Water Code Sections 71640-71644 Article 3. Water Shortages and CA Water Code § 366 (2025) CHAPTER 3.3 - Excessive Residential Water Use During Drought.

8 FINANCIAL CONSEQUENCES OF WSCP

CWC 10632.

(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

To ensure compliance with CWC Chapter 3.3 (commencing with Section 365), additional costs may be incurred to monitor and enforce WSCP actions. These costs may vary depending on the applicable water shortage stage and the duration of the water shortage emergency.

Potential revenue reductions and expense increases associated with activated shortage response actions are regulated and tracked by CPUC memorandum accounts.

GSWC anticipates potential impacts in revenue associated with rates and surcharges. If GSWC establishes a CPUC-approved surcharge to customers to recover revenue, GSWC anticipates that the increase in rates may result in a decline of water usage. Also, the quantity tariff rate may cause a decline in water sales and further reduction in revenue.

GSWC anticipates potential impacts in expenditures associated with operations. An increase in staff cost may be triggered by salaries and benefits for new hires required to

administer and implement the WSCP. Necessary alternative sources of water supply may also increase operations and maintenance costs. Additionally, a new water supply may increase cost of supply and treatment.

Money collected through water use violation fines shall not be accounted for as income but rather booked to a memorandum account to offset authorized expenses incurred or recovery of lost revenue.

All expenses incurred to establish and/or activate Schedule 14.1-SD that have not been considered in a General Rate Case or other proceedings, shall be recoverable by GSWC, as approved by the CPUC. GSWC shall recover expenses in a separate memorandum account for disposition as directed from time to time by the CPUC.

9 MONITORING AND REPORTING

CWC 10632.

(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

GSWC's Water Loss Control Program is used to prepare the annual water loss audits and monitor water losses. GSWC's Operations Engineering Department reviews the audits to track real and apparent losses. Losses are monitored by comparing water production to sales. The Operations Engineer contracts leak detection companies to perform a survey if necessary. If the survey indicates water losses exceed water system goals, a full audit will be performed to identify water loss sources and impacts on the overall water system. Leak locations and work orders for repairs are also documented and processed for potential water use violations and future water loss control actions.

GSWC also conducts an annual review of the Master Plan to address any anticipated water shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions. Additional monitoring and reporting requirements

are approved by the CPUC.

10 WSCP REFINEMENT PROCEDURES

CWC 10632.

(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

GSWC's WSCP has been prepared as an adaptive management plan As discussed in Section 9, GSWC will monitor and report on the implementation of the WSCP. GSWC will review the implementation results for any current or potential shortage gaps between water supplies and demands. GSWC will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. GSWC will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 8 of the UWMP).
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 4.1).
- Implementation of stricter enforcement actions and penalties (discussed in Section 6).
- Improvements to the water supply augmentation responses (discussed in Section 4.2), as well as any associated operational changes (discussed in Section 4.3) which may be required.
- Incorporation of additional actions recommended by GSWC staff or other interested parties.

GSWC will use the monitoring and reporting data to evaluate the ability for these potential revisions to resolve any shortage gaps which may occur within the standard water shortage levels.

This WSCP is adopted as part of GSWC's 2025 UWMP adoption process discussed in Section 9.2 of the UWMP. It is anticipated GSWC will review, revise, and adopt an updated WSCP as part of preparing its 2030 UWMP as necessary. However, GSWC will continue to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to GSWC's WSCP will include a public hearing and adoption process by the GSWC's Board (see Section 12).

11 SPECIAL WATER FEATURE DISTINCTION

CWC 10632.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

GSWC's WSCP defines "decorative water features" as water features which are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water features. As a result, GSWC's WSCP has reviewed the response actions, enforcement actions, and monitoring and reporting programs separately for decorative water features and for pools and spas, as applicable.

Please see Section 4.1. for demand reduction actions in relation to special water features.

12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

CWC 10632.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

CWC 10635.

(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

GSWC's WSCP is adopted as part of GSWC's 2025 UWMP adoption process discussed in Chapter 9 of the UWMP. The process for adopting GSWC's WSCP includes the following:

- GSWC will conduct a public hearing and make the WSCP available for public inspection.
- GSWC will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- GSWC will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- GSWC's Board will adopt the 2025 UWMP and the WSCP.
- As part of submitting the 2025 UWMP to DWR, GSWC will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2026. GSWC will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, GSWC will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

- GSWC will conduct a public hearing and make the amended WSCP available for public inspection.
- GSWC's Board will adopt the amended WSCP.
- GSWC will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.
- Within 30 days after submission of the WSCP to DWR, GSWC will provide the

WSCP to any city or county within which GSWC provides water.

Additional information regarding the adoption, submittal, and availability of GSWC's WSCP (and 2025 UWMP) is provided in Chapter 9 of the UWMP.

APPENDIX A

WATER CONSERVATION ORDINANCES AND RULES

Rule No. 14.1
Water Conservation And Reduction Plan T

GENERAL INFORMATION

1. If requested by a water wholesaler or government agency or if water supplies are projected to be insufficient to meet normal customer demands and are beyond the control of the utility, the utility may elect to activate voluntary conservation using the portion of this plan set forth in Section A of this Rule, after notifying the Director of the Commission's Water Division (WD) of its intent in e-mailed format. The utility's customers shall be notified of the voluntary conservation measures through a bill insert, direct mailing, or electronic notification. (T) (T)

2. Prior or subsequent to the declaration of mandatory reduction by a water wholesaler or government agency, or in the opinion of the utility, mandatory conservation or reduction is needed, the utility may request adding a Schedule No. 14.1 – Water Shortage Contingency Plan with Staged Mandatory Restrictions, Reductions And Drought Surcharges tariff (Schedule No. 14.1), via a Tier 2 advice letter. The utility may request a lost revenue memorandum account at this time. (T) (T)

(D)

3. Schedule No. 14.1 complies with the requirements of the Water Shortage Contingency Plan (WSCP) in Water Code Section 10632 of the Urban Water Management Planning Act. (N)

4. The WSCP requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage) as compared to normal reliability conditions. These water shortage stages have been standardized to allow for a consistent regional and statewide approach to conveying the relative severity of water supply shortage conditions. Reduction of available water supply by the indicated percentages or an equivalent regulatory requirement will trigger an appropriate water shortage stage, and GSWC will implement the response actions as specified in Schedule No. 14.1. (N)

5. The utility shall file a Tier 2 advice letter to request activation of a particular stage of Schedule No. 14.1. (T)

   a. If a Declaration of Mandatory Reductions is made by utility, wholesale supplier, or governing agency, or (T)

   b. If the utility is unable to address voluntary conservation levels set by itself, its wholesale supplier, or governing agency, or (T)

   c. If the utility chooses to activate a greater shortage stage (T)

(L)

(L)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan T

GENERAL INFORMATION (Continued)

(L)

6. When Schedule No. 14.1 is activated and the utility determines that water supplies are again sufficient to meet normal demands, and mandatory rationing measures are no longer necessary, the utility shall seek Commission approval via a Tier 1 advice letter to deactivate the particular stage of mandatory reduction that had been authorized.

7. In the event of a water supply shortage requiring a voluntary or mandatory conservation or demand reduction program, the utility shall make available to its customers water conservation kits as required by its version of Rule No. 20. The utility shall notify all customers of the availability of conservation kits via a bill insert, direct mailers, or electronic notification. (T) (T) (T)(L)

A. VOLUNTARY CONSERVATION (T)

1. Other than upon request, water should not be served in eating and drinking establishments, including but not limited to restaurants, hotels, cafes, bars, or other public places where food or drink are served and/or purchased. (L) (T)
2. Hotels/motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option. (N)
3. Potable water used for irrigation outside of newly constructed homes and buildings shall only be delivered by drip or micro spray systems.
4. Commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water use in an amount consistent with the required reduction. (N)

B. NON-ESSENTIAL OR UNAUTHORIZED WATER (T)

1. No customer shall use utility-supplied water for non-essential or unauthorized uses as defined by the State of California or local ordinances. (D)

2. Water waste resulting from a failure to repair or mitigate any leaks, breaks, or other malfunction in a customer's domestic or outdoor water system within forty-eight (48) hours of notification by the utility, unless other specific arrangements are made and agreed to by the utility, may result in termination of service in accordance with Rule No. 11. (T) (T)

3. The application of potable water to outdoor landscapes in a manner that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures. (T) (T) (L) (L)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan (T)

B. NON-ESSENTIAL OR UNAUTHORIZED WATER USE (Continued) (L)

4. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shutoff nozzle or device attached to it that causes it to cease dispensing water immediately when not in use. (T) (T) (T)

5. The use of potable water for washing buildings, structures, sidewalks, walkways, patios, tennis courts, or other hard surfaced, nonporous areas except to protect the health and safety of the public.

(D)

6. Use of potable water for watering streets with trucks or other vehicles, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect public health and safety.

(D) (D) (D) (D)

7. The use of portable water in a fountain or other decorative water feature, except where the water is part of a recirculating system. (T) (T)

(D)

8. The use of potable water for the irrigation of non-functional turf at commercial, industrial and institutional sites. (N)

9. The use of potable water for watering outside plants, lawn, landscape, and turf area during certain hours prohibited by applicable laws or rules, during and up to 48-hours after measurable rainfall (0.1" or more). (T) (T) (T)

10. The use of potable water for irrigation or ornamental turf on public street medians. (N)

(D)

The outdoor irrigation restriction does not apply to trees or edible vegetation watered solely by drip or micro spray systems. (N) (N)

(L)
|
(L)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan T

C. STAGED MANDATORY REDUCTION OF WATER USAGE (L)

1. Prior to implementing mandatory reduction due to declaration by a water wholesaler, government agency or the utility water supply shortage conditions (per Water Code Section 350), a utility may request the addition of a Schedule No. 14.1 – Water Shortage Contingency Plan with Staged Mandatory Restrictions, Reductions And Drought Surcharges tariff, via a Tier 2 advice letter, with full justification. The utility may not activate Schedule No. 14.1 until authorized to do so by the Commission as delegated to WD. (T)
2. A staged Schedule No. 14.1 authorized by the Commission shall remain dormant until triggered by specific conditions detailed in the Schedule No. 14.1 tariff and the utility has requested and received authorization for activating a stage by the Commission in response to a Tier 2 advice letter. (T) (T)
3. Notice of the Tier 2 advice letter and associated public participation hearing, if required, shall be provided to customers through a bill insert, direct mailing, or by electronic notification. (T)
4. The Utility shall comply with all requirements of Sections 350-358 of the California Water Code. (T)
5. The Tier 2 advice letter requesting the addition of a Schedule No. 14.1 shall include but not be limited to: (T) (L)
   a. Proposed Schedule No. 14.1 tariff, which shall include but not be limited to:
      i) Applicability,
      ii) Territory applicable to,
      iii) A detailed description of each Stage of Reduction, (T)
      iv) A detailed description of the Trigger that Activates each Stage of Reduction, (T)
      v) A detailed description of each water use restriction for each stage of reduction, (T)
      vi) Water use violation levels, written warning levels, associated fines, if applicable, and exception procedures,
      vii) Conditions for installation of a flow restrictor,
      viii) Charges for removal of flow restrictors, and
      ix) Special Conditions.
   b. Justification, documentation and calculations in support of the plan. (T)

(L)

(L)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan T

C. STAGED MANDATORY REDUCTION WATER USAGE (Continued)

6. All monies collected by the utility through water use violation fines shall not be accounted for as income but rather booked to a memorandum account to offset authorized expenses incurred or recovery of lost revenue. Lost revenues associated with reduced sales as a result of activation of either Rule No. 14.1 or Schedule No. 14.1 for a non-WRAM utility should be tracked in a separate memorandum account for disposition as directed or authorized from time to time by the Commission. (L)

7. All expenses incurred by utility to activate Rule No. 14.1 and Schedule No. 14.1 that have not been considered in a General Rate Case or other proceeding, shall be recoverable by utility if determined to be reasonable by Commission. These monies shall be accumulated by the utility in a separate memorandum account for disposition as directed or authorized from time to time by the Commission.

8. Number of stages requested by the district/service area may vary, depending on specifics of water shortage event. The utility shall file a Tier 2 advice letter to request activation of a particular stage of Schedule No. 14.1 under the following conditions: (T)(L) (T)

   a. If the utility is unable to achieve desired conservation levels set by itself, wholesale supplier or governing agency through voluntary conservation, or (T)(L) (T)(L)

   b. If a Declaration of Mandatory Reduction is made by the utility, wholesale supplier or governing agency, or (T) (L)

   c. If a government agency with legal jurisdiction over the utility or its service area declares a state of emergency in response to severe drought conditions, earthquake or other catastrophic event that severely reduces the utility's water supply, or (N)

   d. If voluntary conservation levels or mandatory restrictions on certain uses of water, set by the Commission, the utility, wholesale water supplier, or government agency are insufficient, or (N)

   e. If the utility chooses to activate a greater stage with justification and approval by the Commission. (T)(L)

9. The Tier 2 advice letter requesting activation of a Schedule 14.1 shall include but not be limited to:

   a. Justification for activating this particular stage of mandatory reduction, as well as period during which this particular stage of mandatory conservation and reduction measures will be in effect. (T) (T)

   b. When the utility requests activation of a particular Stage, it shall notify its customers as detailed in Section E below.

Rule No. 14.1
Water Conservation And Reduction Plan T

D. ENFORCEMENT OF STAGED MANDATORY CONSERVATION AND REDUCTION (T)

1. The water use restrictions in Section A of this Rule, become mandatory when the Schedule No. 14.1, Stage 2 or higher is triggered, the utility files a Tier 2 advice letter requesting activation of a Stage 2 or higher, and authorization is received from the Commission as delegated to WD. (T) (T)

2. The nonessential or unauthorized water use listed in Section B of this Rule are always mandatory. (D) (N)

3. Each stage of Schedule No. 14.1 has an associated drought surcharge that may be implemented based on local conditions and/or conservation and reduction targets. (T) (T)

4. The utility may after one written warning, install a flow restricting device on the service line of any customer observed or proven by utility personnel to be using water for any nonessential or unauthorized use as defined in Section A or B above when Schedule No. 14.1 Stage 2 or higher has been activated. (T) (T)

   a. A flow restrictor shall not restrict water delivery by greater than 50% of normal domestic flow and shall be capable of providing the premise with a minimum flow of 50 Gallons Per Capita Per Day (GCPD). The restricting device may be removed only by the utility, only after a (7) seven-day period has elapsed, and only upon payment of the appropriate removal charge as setforth in Schedule No. 14.1. (T) (T)

   b. After the removal of the restricting device, if any non-essential or unauthorized use of water continues, the utility may install another flow restricting device without written notice. This device shall remain in place until water supply conditions warrant its removal and until the appropriate charge for removal is paid to the utility.

   c. Customer tampering with flow restricting device may result in discontinuation of water service at the utility's discretion. (T)

   d. If, despite installation of such flow-restricting device pursuant to the provisions of the previous enforcement conditions, any non-essential or unauthorized use of water continues, then the utility may discontinue water service to such customer. In such event, a charge as provided in Rule No. 11, Section C shall be paid to the utility as a condition of restoration of service. (T)

(Continued)

Rule No. 14.1
Water Conservation And Reduction Plan T

(D)
(D)

E. APPEAL PROCEDURE

1. Any customer who seeks a variance from any of the provisions of this Water Conservation and Reduction Plan shall notify the utility in writing using the appeals form, explaining in detail the reason for such a variation. The utility shall respond to each such request in writing.

2. Any customer not satisfied with the utility's response may contact the Commission. (T)

3. Except as set forth in this Section, no person shall have any right or claim in law or in equity, against the utility because of, or as a result of, any matter or thing done or threatened to be done pursuant to the provisions of the Water Conservation and Reduction Plan. (T)

F. PUBLICITY (L)

1. As stated under Section C.3, when a utility requests the addition of a Schedule No. 14.1, via a Tier 2 advice letter, it shall provide notice of the Tier 2 advice letter and associated public hearing, if applicable, provided to customers through bill inserts, direct mailing, or electronic notification and shall comply with all requirements of Sections 350-358 of the California Water Code (CWC), including but not limited to the following: (T)

   a. In order to be in compliance with both the General Order 96-B and CWC, the utility shall provide notice via both newspaper and bill insert, direct mailing or electronic notification.

   b. Utility shall file one notice for each advice letter filed, that includes both notice of the filing of the Tier 2 advice letter as well as the details of the public hearing (date, time, place, etc.).

   c. The public meeting, if required, shall be held after the utility files the Tier 2 advice letter, and before the Commission authorizes the addition of Schedule No. 14.1 to the tariff except in cases of emergency water shortages approved by WD. (T)

   d. Utility shall consult with WD staff prior to filing advice letter, in order to determine details of public meeting.

(L)

(L)
(L)

Rule No. 14.1
Water Conservation And Reduction Plan T

F. PUBLICITY (Continued)

2. In the event that a Schedule No. 14.1 is activated, and a utility requests activation through the filing of a Tier 2 advice letter, the utility shall notify its customers and provide each customer with a copy of Schedule No. 14.1 by means of bill insert, direct mailing or electronic notification. Notification shall take place prior to imposing any surcharges associated with this plan. If activation of Schedule No. 14.1 occurs one year or more since the public hearing associated with adding Schedule No. 14.1 to its tariffs, then the utility shall conduct a public hearing pursuant to CWC Section 351 prior to activating the mandatory reduction stage.

3. During the period that a stage of Schedule No. 14.1 is activated, the utility shall provide customers with updates regarding its water supply status and the results of customers' conservation efforts. These updates may occur through bill inserts, website updates, or other means of communication. (T) (T) (T)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

A. APPLICABILITY

This Schedule applies to all Golden State Water Company (GSWC) water customers in all Customer Service Areas. This Schedule is effective in times of voluntary conservation or mandatory rationing, as required by Rule No. 14.1. To the extent any provision in this Schedule is inconsistent with Rule No. 14.1, the provisions of this Schedule apply. The drought emergency surcharges listed in this Schedule are in addition to the regular water-use charges under the applicable Schedules as authorized by the California Public Utilities Commission (CPUC) for the respective ratemaking area.

B. TERRITORY

This Schedule is applicable to all GSWC water customers in California.

C. MANDATORY RESTRICTIONS (T) (L) (L) (N) (N)

The State Water Resources Control Board has established the following mandatory restrictions for all water users.

No Customer shall use utility-supplied water for non-essential or unauthorized uses as defined below; customers shall take actions to reduce non-essential and unauthorized water use accordingly as identified below: (L)

a. The application of potable water to outdoor landscapes in a manner that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.
b. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.
c. The use of potable water for washing buildings, structures, sidewalks, walkways, patios, tennis courts, or other hard-surfaced, non-porous areas.
d. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
e. The use of potable water for watering outside plants, lawn, landscape, and turf area during certain hours prohibited by applicable laws or rules, during and up to 48 hours after measurable rainfall (0.1" or more).
f. GSWC will promptly notify customers when aware of leaks within the customer's control; the failure to repair any leaks, breaks, or other malfunction resulting in water waste in a customer's domestic or outdoor water system within forty-eight (48) hours of notification by the utility, unless other, specific arrangements are made with and agreed to by the utility.
g. The serving of water, other than upon request, in eating and drinking establishments, including but not limited to restaurants, hotels, cafes, bars, or other public places where food or drink are served and/or purchased. (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

C. MANDATORY RESTRICTIONS (Continued)

h. Hotels/motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option. (L)
i. The use of potable water for irrigation of ornamental turf on public street medians.
j. The use of potable water for irrigation outside of newly constructed homes and buildings that is not delivered by drip or micro spray systems.
k. Commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water use in an amount consistent with the mandated reduction.
l. Further reduction in or the complete prohibition of any other use of water declared non-essential, unauthorized, prohibited, or unlawful by an authorized government or regulatory agency or official.
m. Use of potable water for watering streets with trucks, or other vehicles, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.
n. The outdoor irrigation restriction does not apply to trees or edible vegetation watered solely by drip or micro spray systems.
o. The use of potable water is prohibited for the irrigation of non-functional turf at commercial, industrial and institutional sites. (N) (N)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (T)

A resolution was adopted on August 2, 2021, by the Board of Directors (Board) of American States Water Company, the parent company of GSWC, in response to drought or water supply shortage conditions. As such, GSWC will implement the appropriate Stage of its Water-Use Reduction Plan to either mitigate the water supply shortage in accordance with the Water Shortage Contingency Plan (WSCP) or to achieve identified water usage goals established by an authorized government agency or official, or as directed under court jurisdiction. The required actions outlined for each stage cannot be implemented until GSWC has filed a Tier 2 Advice Letter with the CPUC and CPUC approval has been obtained. (T)

Response actions for each of the six stages of GSWC's WSCP are as follows:

Stage 1 – Stage 1 is a "Water Alert" where voluntary conservation is encouraged. GSWC explains the drought situation to the public and governmental bodies relying on GSWC water. GSWC explains the potential subsequent water shortage stages in order to forecast possible future actions for the customer base. Under Stage 1, GSWC takes the following actions:

- Implement Voluntary Water Conservation Measures authorized under Rule No. 14.1.
- Establish a voluntary demand reduction target for each water system. (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (Continued) (L)

Stage 1 (Continued)

- Inform public of water shortage conditions or demand reduction targets through some or all of the following: distribution of literature, public meetings, website updates, bill inserts, digital media, conservation messages printed in local newspapers, and educational programs in schools.
- Initiate a Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water-use efficiency.
- Identify the year to be used for establishing the customer baseline water use.
- Recommend voluntary customer outdoor irrigation between the hours of 7 PM and 8 AM per the following Schedule (If a city, county, or other public agency adopts restrictions on the number of days or hours of the day that customers may irrigate, GSWC, at its discretion, may adopt and enforce those restrictions): (T) (T) (T)

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Sunday, Wednesday, Friday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday, Thursday, Saturday

Stage 2 – 20% Mandatory Reduction Stage: Stage 2 is a "Moderate Shortage" and will be implemented if the Stage 1 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 2 will include all actions undertaken in Stage 1. GSWC will require mandatory conservation under this stage. Under Stage 2, GSWC takes the following actions:

- All measures implemented in Stage 1 are implemented in Stage 2.
- Outdoor Irrigation is restricted to between the hours of 7 PM and 8 AM per the following schedule (If a city, county, or other public agency adopts restrictions on the number of days or hours of the day that customers may irrigate, GSWC, at its discretion, may adopt and enforce those restrictions): (T) (T) (T)

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Sunday and Wednesday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday and Saturday

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 20%. (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (Continued)

Stage 2 (Continued) (L)

- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T)

- Water Usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to $2.50 per Ccf. (T) (T)

- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1, C.3., as noted in Section C. of this Schedule. (T)

Stage 3 – 30% Mandatory Reduction Stage: Stage 3 is a "Severe Shortage" and will be implemented if the Stage 2 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 3 will include all actions undertaken in Stage 2. GSWC will require mandatory conservation under this stage. Under Stage 3, GSWC takes the following actions:

- All measures implemented in Stage 2 are implemented in Stage 3.

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 30%.

- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T)

- Water Usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to $5 per Ccf. (T) (T)

- Installation of a flow restrictor for repeated violation of water use restrictions under Rule 14.1 C.3., as noted in Section C. of this Schedule. (T)

Stage 4 - 40% Mandatory Reduction Stage: Stage 4 is a "Critical Shortage" and will be implemented if the Stage 3 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 4 will include all actions undertaken in Stage 3. GSWC will require mandatory conservation under this stage. Under Stage 4, GSWC takes the following actions:

- All measures implemented in Stage 3 are implemented in Stage 4.

- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 40%.

- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T) (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (Continued)

Stage 4 (Continued) (L)

- Water Usage in excess of customer baseline may be charged at regular rate plus a drought emergency surcharge of up to $7.50 per Ccf. (T)
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3., as noted in Section C. of this Schedule. (T)

Stage 5 - 50% Mandatory Reduction Stage: Stage 5 is a "Shortage Crisis" and will be implemented if the Stage 4 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 5 will include all actions undertaken in Stage 4. GSWC will require mandatory conservation under this stage. Under Stage 5, GSWC takes the following actions:

- All measures implemented in Stage 4 are implemented in Stage 5.
- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 50%.
- For residential customer no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T)
- Water Usage in excess of customer baseline to be charged at regular rate plus a drought emergency surcharge of up to $10 per Ccf. (T)
- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3., as noted in Section C. of this Schedule. (T)

Stage 6 - 55% Mandatory Reduction Stage: Stage 6 is an "Emergency Shortage" and will be implemented if the Stage 5 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. Stage 6 will include all actions undertaken in Stage 5. GSWC will require mandatory conservation under this stage. Under Stage 6, GSWC takes the following actions:

- All measures implemented in Stage 5 are implemented in Stage 6.
- GSWC calculates customer conservation allocation based upon the year identified in Stage 1, less 55%. (L)

(Continued)

Schedule No. 14.1
Water Shortage Contingency Plan (T)
With Staged Mandatory Restrictions, Reductions And Drought Surcharges (T)

D. WATER USE REDUCTIONS AND DROUGHT SURCHARGES (Continued)

Stage 6 (Continued) (L)

- For residential customers no allocation will be set less than eight (8) Ccf per monthly billing period or 16 Ccf per bi-monthly billing period, unless directed otherwise by an authorized government agency. (T)

- Water Usage in excess of customer baseline to be charged at regular rate plus a drought emergency surcharge of up to $15 per Ccf. (T)

- Installation of a flow restrictor for repeated violation of water use restrictions under Rule No. 14.1 C.3., as noted in Section C. of this Schedule. (T)

E. DROUGHT SURCHARGES (N)

Excess usage above the baseline drought allocation may result in a Drought Surcharge. The Drought Surcharge is in addition to the base charges allowed under the applicable tariffs authorized by the CPUC.

Customers participating in the Utility's Low Income Customer Assistance Program shall be entitled to a 50% reduction in the Drought Surcharge. (N)

F. FLOW RESTRICTOR CHARGES (T)

The charge for installation and removal of a flow-restricting device shall be:

Connection Size	Charges
5/8″ to 1″	$150
1-1/2″ to 2″	$200
3″ and larger	$300

The flow restrictor will remain installed for a minimum of seven (7) days.

G. EXEMPTION AND APPEALS PROCESS (T)

Any customer who seeks a variance from any of the provisions of this voluntary water conservation plan and/or mandatory conservation plan shall notify the utility in writing, explaining in detail the reason for such a variation. The utility shall respond to each such request in writing.

The appeals form is available online at GSWC website: www.gswater.com/appeal or by calling GSWC's 24-Hour Customer Service Hotline at 1-800-999-4033. (L)

Schedule No. 14.1
Water Shortage Contingency Plan
With Staged Mandatory Restrictions, Reductions And Drought Surcharges

H. SPECIAL CONDITIONS

1. A Tier 2 advice letter will have to be filed with the CPUC to activate any of the Stages of Water Use Reduction and Drought Emergency Surcharges listed in this Schedule.

2. The active Stage of Water Use Reduction and Drought Emergency Surcharges is to remain in effect until a Tier 2 advice letter is filed with the CPUC to activate a different Stage or when Schedule No. 14.1 is deactivated.

3. Water-use violation fines and/or Drought Emergency Surcharges must be separately identified on each bill.

4. All bills are subject to reimbursement fee set forth on Schedule No. UF.

5. All revenue collected by the utility through water use violation fines and/or Drought Emergency Surcharges shall not be accounted for as income, but shall be accumulated in the General Ratemaking Area Balancing Account (GRABA). (T)

(Continued)

SCHEDULE 14.1-SD

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

A. APPLICABILITY

This schedule applies to all water customers in the San Dimas Customer Service Area (SD CSA) served under Tariff Schedule R3-1-R, R3-1-NR and R3-SD3. This schedule is only effective in times of mandatory rationing, as required by Rule No. 14.1, and only for the period noted in the Special Conditions section below. The drought emergency surcharges listed in this schedule are in addition to the regular water use charges under the current Schedules referenced above as authorized by the Commission.

B. TERRITORY

This schedule is applicable to customers in San Dimas Customer Service Area only.

C. MANDATORY WATER USE REDUCTION AND DROUGHT EMERGENCY SURCHARGES

In response to the Governor's Executive Order (B-29-15) the State Water Resources Control Board (Water Board) imposed restrictions to achieve a statewide 25% reduction in potable urban water usage through February 28, 2016. These restrictions will require water consumers to reduce usage as compared to the amount they used in 2013. Golden State Water Company (GSWC) consumers reduced usage in 2014, but will need to achieve additional water conservation in 2015-16 to achieve the statewide goal.

These restrictions are designed to strongly encourage those customers with high per capita usage to achieve proportionally greater reduction than those with low use. The annual mandated reduction for this area is 28%. The following stages will be implemented as needed to achieve the annual mandated reduction. The utility may implement Stage 2 and the associated Drought Emergency Surcharge without first implementing Stage 1 if warranted by the mandated reduction.

(N)

(Continued)

SCHEDULE 14.1-SD

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

Stage 1

Outdoor irrigation is restricted to two days per week:

Addresses Ending In:	Watering Days
Even Numbers (0, 2, 4, 6, 8)	Monday and Thursday
Odd Numbers (1, 3, 5, 7, 9)	Tuesday and Friday

Additional restrictions:

All outdoor irrigation must occur between the hours of 7 pm and 8 am.

Failure to comply with these restrictions may result in the installation of a flow restrictor device along with associated fees for installation and removal.

If conditions warrant, GSWC will change the number of watering days and the specific day of watering after first notifying its customers in accordance with Rule 14.1.

Stage 2

Will be implemented if the Stage 1 restrictions are deemed insufficient to achieve reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official.

In addition to the restrictions identified in Stage 1, the following allocations and drought emergency surcharges are in effect:

1. All customers will have their baseline established using the 2013 usage data for their premise or an area wide average baseline for similar usage if 2013 data does not exist (e.g. new customer accounts).
2. The customer's allocation will be based on the 2013 baseline less 28%.
3. No allocation will be set less than eight (8) Ccf per monthly billing period or sixteen (16) Ccf per bi-monthly billing period.
4. All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $2.50 per ccf.

(N)

(Continued)

SCHEDULE 14.1-SD

STAGED MANDATORY CONSERVATION AND RATIONING

Stage 3
Will be implemented if the Stage 2 allocations and drought emergency surcharges are deemed insufficient to achieve reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official. (N)

In addition to the restrictions identified in Stage 1, the following allocations are in effect:

1. All customers will have their baseline established using the 2013 usage data for their premise or an area wide average baseline for similar usage if 2013 data does not exist (e.g. new customer accounts).
2. The customer's allocation will be based on the 2013 baseline less 28%.
3. No allocation will be set less than eight (8) Ccf per monthly billing period or sixteen (16) Ccf per bi-monthly billing period.
4. All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $5.00 per ccf.

Stage 4
Will be implemented if the Stage 3 allocations and drought emergency surcharges are deemed insufficient to achieve reductions due to water supply shortages or to achieve identified water usage goals established by an authorized government agency or official.

In addition to the restrictions identified in Stage 1, the following allocations are in effect:

1. All customers will have their baseline established using the 2013 usage data for their premise or an area wide average baseline for similar usage if 2013 data does not exist (e.g. new customer accounts).
2. The customer's allocation will be based on the 2013 baseline less 28%.
3. No allocation will be set less than eight (8) Ccf per monthly billing period or sixteen (16) Ccf per bi-monthly billing period.
4. All usage in excess of the customer's allocation will be charged at the regular rate plus a drought emergency surcharge of $10.00 per ccf.

(N)

(Continued)

SCHEDULE 14.1-SD

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

D. FLOW RESTRICTOR CHARGES

The charge for installation and removal of a flow-restricting device shall be:

Connection Size	Charges
5/8" to 1"	$150.00
1-1/2" to 2"	$200.00
3" and larger	$300.00

The flow restrictor will remain installed for a minimum of 7 days.

E. EXEMPTION AND APPEALS PROCESS

Any customer who seeks a variance from any of the provisions of this voluntary water conservation and mandatory rationing plan shall notify the utility in writing, explaining in detail the reason for such a variation. The utility shall respond to each such request in writing.

The appeals form is available online at GSWC website: www.gswater.com/appeal, the San Dimas CSA office located at 121 Exchange Place, San Dimas, CA or by calling 1-800-999-4033.

(N)

(Continued)

SCHEDULE 14.1-SD

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

F. SPECIAL CONDITIONS

1. A Tier 2 advice letter will have to be filed with the Commission to activate any of the Stages of Mandatory Water Use Reduction and Drought Emergency Surcharges listed in this schedule.

2. The active Stage of Mandatory Water Use Reduction and Drought Emergency Surcharges is to remain in effect until a Tier 2 advice letter is filed with the Commission to activate a different Stage or when Schedule 14.1-SD is deactivated.

3. Water use violation fines and/or Drought Emergency Surcharges must be separately identified on each bill.

4. All bills are subject to reimbursement fee set forth on Schedule No. UF.

5. All monies collected by the utility through water use violation fines and/or Drought Emergency Surcharges shall not be accounted for as income, but shall be accumulated in the WRAM and lost revenue portion tracked in the Water Conservation Memorandum Account (WCMA) for non-WRAM tariffs.

6. No Customer shall use utility-supplied water for non-essential or unauthorized uses as defined below:

   a. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flow onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.
   b. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

(N)

(Continued)

SCHEDULE 14.1-SD

STAGED MANDATORY CONSERVATION AND RATIONING

(N)

c. The use of potable water for washing buildings, structures, sidewalks, walkways, patios, tennis courts, or other hard-surfaced, non-porous areas.
d. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
e. The use of potable water for watering outside plants, lawn, landscape, and turf area during certain hours prohibited by applicable laws, during and up to 48 hours after measurable rainfall (0.1" or more).
f. GSWC will promptly notify customers when aware of leaks within the customer's control; the failure to repair any leaks, breaks, or other malfunction resulting in water waste in a customer's domestic or outdoor water system within forty-eight (48) hours of notification by the utility, unless other, specific arrangements are made with and agreed to by the utility.
g. The serving of water, other than upon request, in eating and drinking establishments, including but not limited to restaurants, hotels, cafes, bars, or other public places where food or drink are served and/or purchased.
h. Hotels/motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.
i. The use of potable water for irrigation of ornamental turf on public street medians.
j. The use of potable water for irrigation outside of newly constructed homes and buildings that is not delivered by drip or micro spray systems.
k. Commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, immediately implement water efficiency measures to reduce potable water use in an amount consistent with the mandated reduction.
l. Further Reduction in or the complete prohibition of any other use of water declared non-essential, unauthorized, prohibited, or unlawful by an authorized government or regulatory agency or official.
m. Use of potable water for watering streets with trucks, or other vehicles, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.

7. The outdoor irrigation restriction does not apply to trees or edible vegetation watered solely by drip or microspray systems.

(N)

Rule No. 20

WATER CONSERVATION

A. Purpose
The purpose of this rule is to ensure that water resources available to the utility are put to a reasonable beneficial use and that the benefits of the utility's water water supply and service extend to the largest number of persons.

B. Waste of Water Discouraged
Refer to Rule 11 B. (3).

C. Use of Water-Saving Devices and Practices
Each customer of the utility is encouraged to install water saving devices to reduce the quantity of water used within the residence. Each customer is further encouraged to adopt such other water usage and re-usage practices and procedures as are feasible and reasonable. (T) (T)

D. Water-Saving Kits
The utility will make available, without initial cost to the customer, for use in each residence receiving water service from the utility, a water-saving kit containing the following:

(D)

(1) A device or devices for reducing faucet and shower flow rates; (T)

(2) A dye tablet or tablets for determining if a toilet tank leaks;

(3) Other devices and programs from time to time approved by the utility; (T)

(4) Installation and other instructions and information pertinent to conserving water. (T)

ORDINANCE 1240

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF SAN DIMAS, COUNTY OF LOS ANGELES ADOPTING MUNICIPAL CODE TEXT AMENDMENT 15-07 TO AMEND SECTION 18.14, WATER-EFFICIENT LANDSCAPES.

THE CITY COUNCIL OF THE CITY OF SAN DIMAS DOES ORDAIN AS FOLLOWS:

SECTION 1. Title 18 of the San Dimas Municipal Code shall be amended, as provided for in Exhibit "A"

SECTION 2. This Ordinance shall take effect 30 days after its final passage, and within 15 days after its passage the City Clerk shall cause it to be published in the Inland Valley Daily Bulletin, a newspaper of general circulation in the City of San Dimas hereby designated for that purpose.

PASSED, APPROVED AND ADOPTED by the city Council of the City of San Dimas this 26TH day of January, 2016.

Curtis W. Morris, Mayor City of San Dimas

ATTEST:

Debra Black, Assistant City Clerk

APPROVED AS TO FORM:

Mark Steres, City Attorney

I, DEBRA BLACK, ASSISTANT CITY CLERK, of the City of San Dimas, do hereby certify that Ordinance 1240 was introduced at a regular meeting of the City Council of the City of San Dimas on the 12th day of January, 2016, and thereafter passed, approved and adopted at a regular meeting of said City Council held on the 26th day of January, 2016, by the following vote:

AYES: Badar, Bertone, Ebiner, Templeman, Morris
NOES: None
ABSENT: None
ABSTAIN: None

Debra Black, Assistant City Clerk

Chapter 18.14

WATER-EFFICIENT LANDSCAPES

Sections:

18.14.010	**Purpose and Intent**
18.14.020	**Definitions**
18.14.030	**Applicability**
18.14.040	**Exemptions**
18.14.050	**Implementation Procedures**
18.14.060	**Landscape Water Use Standards**
18.14.070	**Existing Landscapes**
18.14.080	**Alternative Landscapes**
18.14.090	**Minor Deviations**
18.14.100	**Implementation Guidelines**
18.14.110	**Enforcement and Penalties**

18.14.010 Purpose and Intent

The intent of the water-efficient landscape chapter is:

A. That this Chapter be at least as effective in conserving water as the State Model Water Efficient Landscape Ordinance and consistent with Governor Brown's April 1, 2015 Drought Executive Order B-19-25;

B. Establish a structure for planning, designing, installing, and maintaining and managing water efficient landscapes in new construction and rehabilitated projects;

C. Establish provisions for water management practices and water waste prevention for existing landscapes;

D. To assure beneficial, efficient, and responsible use of water resources;

E. To retain the land's natural hydrological role and promote the infiltration of surface water into the groundwater;

F. To recognize that landscapes enhance the aesthetic appearance of developments and communities;

G. To encourage the appropriate design, installation, maintenance, and management of landscapes so that water demand can be decreased, runoff can be retained, and flooding can be reduced without a decline in the quality or quantity of landscapes; and

H. To reduce or eliminate water waste.

18.14.020 Definitions

"Aggregate" area pertains to production home neighborhoods, common interest developments, or other situations where multiple parcels are undergoing landscape development as one project, but may eventually be individually owned or maintained.

"Applied water" means the portion of water supplied by the irrigation system to the landscape.

"***Artificial Turf***" means a man-made material which simulates the appearance of live turf, organic turf, grass, sod, or lawn.

"***Automatic irrigation controller***" means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

"***Backflow prevention device***" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

"***Chapter***" means Chapter 18.14 of the San Dimas Municipal Code.

"***Check valve***" or "***anti-drain valve***" means a valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

"City" means the City of San Dimas

"***Certified Landscape Irrigation Auditor***" means person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.

"***Certification of Design***" means the certification included as Exhibit E of the Implementation Guidelines that shall be included in the *Landscape Documentation Package* pursuant to Section 2.1 of the Guidelines.

"***Common interest developments***" means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

"***Conversion factor***" means the number that converts acre-inches per acre per year to gallons per square foot per year.

"***Drip irrigation***" means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

"Drought tolerant landscaping" means landscaping that utilizes little or no irrigation through the use of water-conserving materials and techniques, including but not limited to, native drought-tolerant plants, mulch and efficient irrigation.

"Ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

"***Emitter***" means a drip irrigation emission device that delivers water slowly from the system to the soil.

"***Estimated Applied Water Use***" or "EAWU" means the annual total amount of water estimated to keep plants in a healthy state. It is based on factors such as reference evapotranspiration rate, the size of the landscaped area, plant water use factors, and the irrigation efficiency within each hydrozone.

"***Evapotranspiration adjustment factor***" or "ETAF" means a factor of.55 for residential areas and 0.45 for non- residential areas, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape The ETAF for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0. The ETAF for existing non-rehabilitated landscapes is 0.8

"***Evapotranspiration rate***" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

"***Flow rate***" means the rate at which water flows through pipes, *valves* and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

"Front yard" for purposes of this Chapter and the Guidelines, shall mean the required front yard setback and any area between the street and the outline of the main building line. For other unique lot configurations, the Director of Development Services shall determine front yard.

"Front yard landscaped area" means 50% of the Front Yard Area that requires to be landscaped with live vegetation, artificial turf, drought tolerant landscaping or a combination of all three.

"***Graywater***" means a system untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthy processing, manufacturing, or operating wastes. Graywater includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines. And laundry

tubs, but does not include wastewater from kitchen sinks or dishwashers as per the Health and Safety Code (Section 17922.12). Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to the California Plumbing Code (Title 24, Part 5, Chapter 16) and any applicable local ordinance standards.

"Hardscapes" means any durable material or feature (pervious or non-pervious) installed in or around a landscape area, such as pavements, concrete, asphalt, bricks or stone. Pools and other water features are considered part of the landscaped area and not considered hardscapes for purposes of this Chapter and the Guidelines.

"Hydrozone" means a portion of the landscaped area having plants with similar water needs and typically irrigated by one valve/controller station. A hydrozone may be irrigated or non-irrigated.

"Implementation Guidelines" means the Water Efficient Landscape Ordinance Guidelines which shall be adopted by resolution of the Planning Commission. The purpose of the Guidelines is to provide procedural and design guidance for applicants proposing new landscape or landscape rehabilitation projects that are subject to Chapter 18.14 of the City of San Dimas Municipal Code.

"***Infiltration rate***" means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

"***Invasive plants species***" or "*noxious*" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive plant species may be regulated by county agricultural agencies as *noxious species*.

"***Irrigation audit***" means an in-depth evaluation of the performance of an irrigation system conducted by a *Certified Landscape Irrigation Auditor*. An *irrigation audit* includes, but is not limited to: inspection, system tune-up, system test with *distribution uniformity* or emission uniformity, reporting *overspray* or *runoff* that causes overland flow, and preparation of an irrigation schedule.

"Irrigation efficiency" or "IE" means the measurement of the amount of water beneficially used divided by the amount of water applied to a landscaped area. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this Chapter and the Guidelines is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems. The following irrigation efficiency may be obtained for the listed irrigation heads with an IME of 90%:

Irrigation Method	**DU_{LQ}**	**DU_{LH}***	**EU**	**IE****
Spray nozzles	65%	79%		71%
High efficiency spray nozzles	75%	82%		73%
Multi stream/Multi trajectory rotary (MSMT) nozzles	75%	85%		76%

Stream rotor nozzle	70%	82%		73%
Microspray	75%	85%		76%
Bubblers			85%	77%
Drip emitter			90%	81%
Subsurface drip			90%	81%

*$DU_{LH} = .386 + (.614)(DU_{LQ})$
** IE (spray) = (DU_{LH})(IME)
** IE (drip) = Emission uniformity (EU)(IME)

"***Irrigation Management Efficiency***" or "*IME*" means the measurement used to calculate the irrigation efficiency of the irrigation system for a landscaped project. A 90% IME can be achieved by using evaportranspiration controllers, soil moisture sensors, and other methods that will adjust irrigation run times to meet plant water needs.

"***Landscape coefficient***" (K_L) is the product of a plant factor multiplied by a density factor and a microclimate factor. The landscape coefficient is derived to estimate water loss from irrigated landscaped areas and special landscaped areas.

"Landscape documentation package" means the package of documents that a project applicant is required to submit to the City pursuant to Section 2.1 of the Guidelines.

"Landscape installation certificate of completion" means the certificate included as Appendix E of the Guidelines that shall be submitted to the City pursuant to Section 2.7(c)(1) of the Guidelines.

"Landscape professional" means a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape pursuant to Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the California Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the California Food and Agriculture Code.

"Landscaped area" means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance and Estimated Applied Water Use calculations. The landscaped area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

"***Lateral line***" means the water delivery pipeline that supplies water to the emitters or sprinklers from the *valve*.

"***Low volume irrigation***" means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

"Low volume overhead irrigation" means aboveground irrigation heads with an upper flow limit of 0.5 GPM.

"***Main line***" means the pressurized pipeline that delivers water from the water source to the *valve* or outlet.

"Manual isolation valve" means a valve such as a gate valve, ball valve, or butterfly valve installed downstream of the point of connection of the water supply to shutdown water flow through mainline piping for routine maintenance and emergency repair.
"Master shut-off valve" an electronic valve such as a solenoid valve installed as close as possible to the point of connection and is used in conjunction with a flow sensor and flow monitoring controller technology to automatically shutdown system wide water flow in the event of high flow conditions such as mainline pipe break.

"***Maximum applied water allowance***" or "*MAWA*" means the upper limit of annual applied water for the established *landscaped area,* as specified in Section 2.2 of the Guidelines. It is based upon the area's *reference evapotranspiration*, the *ETAF*, and the size of the *landscaped area*. The *Estimated Applied Water Use* shall not exceed the *Maximum Applied Water Allowance.*

"Microclimate" means the climate of a small, specific area that may contrast with the climate of the overall landscaped area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

"Mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface mining and Reclamation Act of 1975.

"***Mulch***" means any organic material such as leaves, bark, straw or compost, or inorganic mineral materials such as rocks, gravel, or decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

"***Non-pervious***" means any surface or natural material that does not allow for the passage of water through the material and into the underlying soil.

"***Operating pressure***" means the pressure at which the parts of an irrigation system of sprinklers are designed to operate at by the manufacturer.

"***Overspray***" means the irrigation water which is delivered beyond the target area.

"Parkway" for purposes of this Chapter and the Guidelines, means that portion of a public street which is not improved for actual street, curb, gutter or sidewalk use and which is available for planting and maintaining street trees.

"Person" means any natural person, firm, joint venture, joint stock company, partnership, public or private association, club, company, corporation, business trust, organization, public or private agency, government agency or institution, school district, college,

university, any other user of water provided by the City or the local water purveyor, or the manager, lessee, agent, servant, officer, or employee of any of them or any other entity which is recognized by law as the subject of rights or duties.

"***Pervious***" means any surface or material that allows the passage of water through the material and into the underlying soil.

"***Plant factor***" or "*plant water use factor*" is a factor, when multiplied by *ETo*, that estimates the amount of water needed by plants. For purposes of this *Water Efficient Landscape Ordinance*, the *plant factor* range for very low water use plants is 0 to 0.1; the *plant factor* range for low water use plants is 0 to 0.3; the *plant factor* range for moderate water use plants is 0.4 to 0.6; and the *plant factor* range for high water use plants is 0.7 to 1.0. *Plant factors* cited in the Guidelines are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species."

"***Precipitation rate***" means the rate of application of water measured in inches per hour.

"Project applicant" means the individual or entity submitting a Landscape Documentation Package required under Section 2.1 to request a permit, plan check, or design review from the City. A project applicant may be the property owner or his or her designee.

"Property owner" or "owner" means the record owner of real property as shown on the most recently issued equalized assessment roll.

"Rain sensor" or "rain sensing shutoff device" means a component which automatically suspends irrigation when it rains.

"Recreational area" means areas, excluding private single family residential areas, designated for active play, recreation or public assembly in parks, sports fields, picnic grounds, amphitheaters, or golf course tees, fairways, roughs, surrounds and greens.

"Reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. ETo is given expressed in inches per day, month, or year as represented in Appendix C of the Guidelines, and is an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowances.

"***Recycled water***" or "***reclaimed water***" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

"Rehabilitated landscape" means any re-landscaping project that requires a permit, plan check, or design review, meets the requirement of Section 1.2 of the Guidelines, and the modified landscape area is equal to or greater than 2,500 square feet.

"***Runoff***" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscaped area. For example, *runoff* may result from water that is applied at too great a rate (application rate exceeds *infiltration rate*) or when there is a slope.

"SMART irrigation controller" or "Soil moisture sensor" means a weather-based or soil moisture-based irrigation controller that monitors and uses information about the environmental conditions at a specific location and landscape to automatically adjust watering schedules.

"***Soil texture***" means the classification of soil based on its percentage of sand, silt, and clay.

"Special Landscaped Areas" or "SLA" means an area of the landscape dedicated solely to edible plants such as orchards and vegetable gardens, areas irrigated with recycled water, water features using recycled water, and areas designated as a Recreational Area.

"***Sprinkler head***" means a device which delivers water through a nozzle.

"***Static water pressure***" means the pipeline or municipal water supply pressure when water is not flowing.

"***Station***" means an area served by one *valve* or by a set of *valves* that operate simultaneously.

"***Swing joint***" means an irrigation component that provides a leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

"Turf" means a ground cover surface of mowed grass.

"***Valve***" means a device used to control the flow of water in an irrigation system.

"Visible street side yard" for purposes of this Chapter and the Guidelines, means any street side yard that is visible from the public right of way which shall be required to be landscaped with a minimum of 50% of live vegetation, artificial turf, drought tolerant landscaping or a combination of all three.

"***Water Efficient Landscape Ordinance***" means Chapter 18.14 of the City of San Dimas Municipal Zoning Code.

"***Water Efficient Landscape Worksheet***" means the worksheet required to be completed pursuant to Section 2.2 of the Guidelines and which are included in Appendix C of the Guidelines.

"Water feature" means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscaped area. Constructed wetlands used for on-site wastewater treatment, habitat protection, or storm water best management practices that are not irrigated and used solely for water treatment or storm water retention are not water features and, therefore, are not subject to the water budget calculation.

"***Watering window***" means the time of day irrigation is allowed.

"***WUCOLS***" means the Water Use Classification of Landscape published by the University of California Cooperative Extension, the Department of Water Resources, and the Bureau of Reclamation, 2000. *www.owue.water.ca.gov/docs/wucols00*

18.14.030 Applicability

A. Beginning February 1, 2016, all landscaping projects subject to this Chapter shall obtain a permit from the Department of Development Services prior to installation of any landscaping. All planting, irrigation, and landscape related improvements required by this Chapter shall apply to the flowing landscape projects:

1. New landscape projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review;
2. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check or design review;
3. New or rehabilitated landscape projects between 500 and 2,500 square feet may comply with the performance requirements of this ordinance or conform to the prescriptive measures contained in Appendix A of the Guidelines;
4. New or rehabilitated projects using treated or untreated graywater or rainwater capture on site, any lot or parcels within the project that has less than 2,500 square feet of landscape area and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with the treated or untreated graywater or though stored rainwater capture on site is subject only to Appendix A Section (5) of the Guidelines;
5. Special Landscaped Areas, such as areas dedicated to edible plants, irrigated with recycled water, or dedicated to active play, shall prepare a water efficient landscape worksheet and landscape documentation package according to specifications for Special Landscaped Areas;
6. Cemeteries. Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are limited to Sections 2.2 and 2.9 of the Guidelines; and existing cemeteries are limited to Section 3 of the Guidelines.
7. Irrigation of landscaped areas of any size shall be conducted in a manner conforming to the rules and requirements, and shall be subject to penalties and incentives for water conservation and water waste prevention as determined and

implemented by the local water purveyor or as mutually agreed by the local water purveyor and the City of San Dimas.

8. Existing landscapes that are one acre or more shall not exceed their Maximum Applied Water Allowance.

B. Section 18.14.070 of this chapter regarding water conservation and water waste applies to all landscaped areas installed prior to or after January 1, 2010.

C. Section 18.14.030 of this chapter shall apply to all landscape areas installed after February 1, 2016.

18.14.040 Exemptions

A. This Chapter does not apply to:

1. Registered local, state, or federal historical sites;
2. Ecological restoration projects that do not require a permanent irrigation system;
3. Mined-land reclamation projects that do not require a permanent irrigation system; or
4. Plant collections, as part of botanical gardens and arboretums open to the public.

B. Except as provided in this Chapter a permit is required before the installation or rehabilitation of a landscape. Before a permit is issued the Director of Development Services or his designee must ensure the proposed landscape is in conformity with the conditions set forth in this Chapter.

18.14.050 Implementation Procedures

A. Prior to installation, a "Landscape Documentation Package" shall be submitted to the Development Services Department for review and approval of all landscape projects subject to the provisions of this Chapter. Any "Landscape Documentation Package" submitted shall comply with the adopted Guidelines.

B. Prior to assembling the landscape documentation Package, applicants are advised to consult the Development Services Department to ascertain if the subject property is located within an area subject to additional landscape requirements including, but not limited to various custom lot areas and scenic corridors. Information regarding additional landscape requirements shall be made available upon request.

C. Other regulations affecting landscape design and maintenance practices are potentially applicable and should be consulted for additional requirements. These regulations include but may not be limited to:

1. State of California Section 65595;
2. National Pollutant Discharge Elimination Permit for the Municipal Separate Sewer System;
3. Water Conservation and Drought Response Regulations of the Local Water Purveyor;
4. Zoning Code;

5. Building Code;
6. Specific Plans, Master Plans, General Plan, or similar land use and planning documents; and
7. Conditions of approval for a specific project.

D. Landscape and irrigation plans submitted to the Development Services Department for review and approval shall include appropriate water use calculations.

E. The "Landscape Documentation Package" shall bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. This ordinance shall not be deemed to prohibit any person from preparing any plans, drawings, or specifications for any property owned by that person.

F. Verification of compliance of the landscape installation with the approved plans shall be obtained through a "Certificate of Completion" in conjunction with the final permit process, as provided in the Guidelines and are certified to be in compliance with the provisions of this Chapter and Guidelines and that the landscaping has been completed in accordance with the approved plans.

18.14.060 Landscape Water Use Standards

A. For applicable landscape installation or rehabilitation projects subject to this Chapter, the "Estimated Applied Water" use allowed for the landscaped areas shall not exceed the "Maximum Applied Water Allowance" calculated using an "ET adjustment factor" of 0.55 for residential areas and 0.45 for non-residential areas, exclusive of Special Landscape Areas, except for special landscaped areas where the "Maximum Applied Water Allowance" is calculated using an "ET adjustment factor" of 1.0; or the design of the landscaped area shall otherwise be shown to be equivalently water-efficient in a manner acceptable to the City as provided in the Guidelines.

18.14.070 Existing Landscapes

A. Irrigation of landscaped areas of any size shall be conducted in a manner conforming to the rules and requirements and shall be subject to penalties and incentives for water conservation and waste prevention, as determined and implemented by the local water purveyor and as may be mutually agreed by the City.

B. The City and/or local water purveyor may administer programs such as irrigation water use analyses, irrigation surveys and/or irrigation audits, tiered meter rate structures, water budgeting by parcel, or other approaches to achieve landscape water use efficiency community-wide to a level equivalent to or less than would be achieved by applying a MAWA calculated with an ETAF of 0.8 to all landscaped areas in the City over one acre in size.

C. The architectural guidelines of a common interest development, including apartments, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

D. Water Waste Prevention

1. Water waste resulting from inefficient landscape irrigation leading to excessive runoff, low head drainage, overspray and other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways or structures is prohibited.
2. All landscape areas, whether installed pursuant to this chapter or not, shall be maintained in a healthful and sound condition. Irrigation systems and their components shall be maintained in a fully functional manner consistent with the originally approved design and the provisions of this chapter.
3. Landscapes shall be maintained to ensure water efficiency. A regular maintenance schedule should include but not be limited to checking, adjusting, and repairing irrigation equipment; resetting the automatic controller; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; and weeding in all landscaped areas.

18.14.080 Alternative Landscapes

A. Artificial or synthetic turf is an appropriate substitute for natural turf in some cases for the purposes of water conservation. Installation and maintenance of artificial turf shall be governed by Guidelines which shall be adopted as set forth in section 18.14.100.

B. Drought tolerant landscapes may be an appropriate substitute, in some cases, for natural turf for the purposes of water conservation. When installed correctly, drought tolerant landscapes can provide aesthetic curb appeal and provide an appealing community environment, while utilizing little to no water consumption. Installation and maintenance of artificial turf shall be governed by Guidelines which shall be adopted as set forth in section 18.14.100.

18.14.90 Minor Deviations

A. The Director of Development Services or his or her designee may grant minor deviations from the requirements of this chapter limited to the following:

1. Minor modifications to approved landscaping irrigation or grading plans, which comply with the spirit and intent of this chapter and the accompanying Guidelines;
2. Modifications of planting, installation, and/or preparation details;

3. Final of permits prior to installation of landscaping due to exceptional and unforeseen circumstance, subject to the deposit of an appropriate performance guarantee with the Development Services Department.

B. In granting a minor deviation, the Director of Development Services or his or her designee may impose conditions, as deemed necessary, to comply with the spirit and intent of this chapter and accompanying Guidelines;

C. The Director of Development Services Department decision may be appealed to Development Plan Review Board in writing pursuant to the provisions of Chapter 18.212.

18.14.100 Implementation Guidelines

This Water Efficient Landscape Ordinance Guidelines shall be adopted by resolution of the Planning Commission.

18.14.110 Enforcement and Penalties

A. Any firm, corporation or person, whether as principal, agent, employee or otherwise, violating or causing the violation of any of the provisions of this chapter shall be guilty of a misdemeanor, and any conviction thereof shall be punishable as set forth in Chapter 1.12 of the San Dimas Municipal Code.

B. Nothing herein shall prevent or restrict the city from taking such other lawful action in any court of competent jurisdiction as is necessary to prevent or remedy any violation or noncompliance. Such other lawful actions shall include, but shall not be limited to, an equitable action for injunctive relief or an action at law for damages.

C. Further, nothing in this section shall be construed to prohibit the city from prosecuting any violation of this chapter by means of code enforcement established pursuant to the authority as provided by the laws of the state of California and the City of San Dimas.

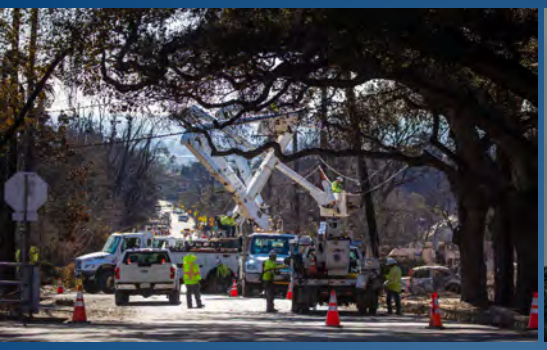
D. Any violation of the provisions of this chapter shall constitute a separate offense for each and every day during which such violation is committed or continued.

APPENDIX B

COUNTY OF LOS ANGELES' ALL-HAZARDS MITIGATION PLAN

2025 County of Los Angeles All-Hazards Mitigation Plan

Chief Executive Office - Office of Emergency Management









Acknowledgement

The Los Angeles County Board of Supervisors gratefully acknowledges the following agencies/jurisdictions who contributed to the development of this plan.

County Departments

Aging and Disabilities
Chief Executive Office
Chief Sustainability Office
Beaches and Harbors
Economic Opportunity
Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

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Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

9/9/25
Date

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1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team
	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

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Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview



Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use



Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

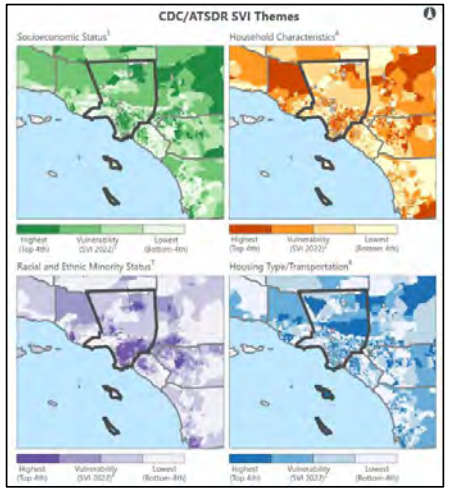


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

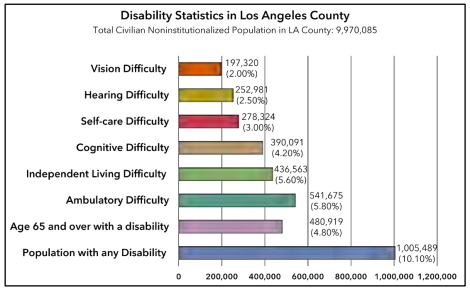


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

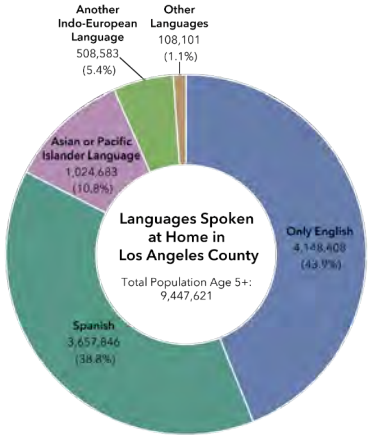


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

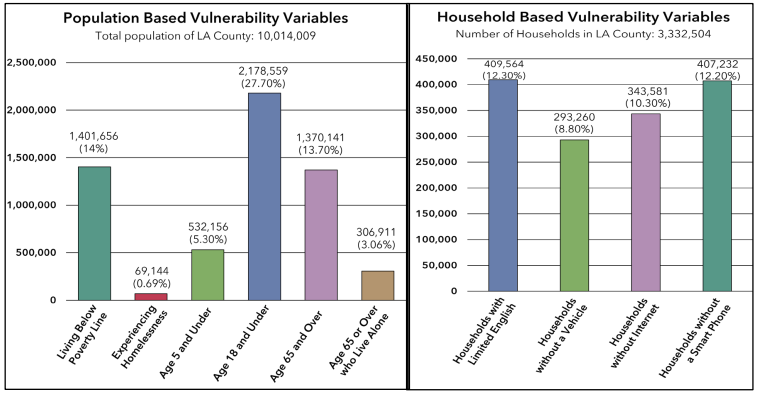


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

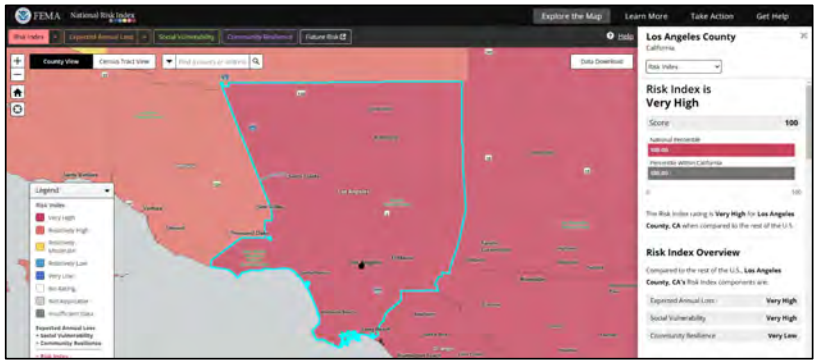


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.

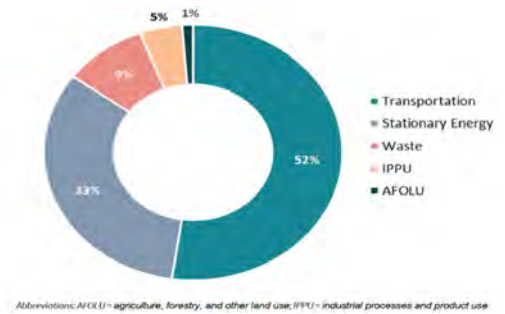


Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
  - Surveys of community needs
  - Consultations with AFN advisory groups
  - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.



- **C-MIST Explanation**
  - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
  - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
  - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
  - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
  - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.



6.2 Wildfire

6.2.1 Nature



Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows—especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD3**: 117.95 sq mi (27.29%)
    - **SD5**: 95.61 sq mi (3.36%)
    - **SD1**: 16.23 sq mi (4.60%)
    - **SD4**: 9.10 sq mi (4.27%)
    - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.



6.3 Earthquake

6.3.1 Nature



Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant. Buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 1,950.78 sq mi (69.50%)
    - **SD3**: 379.41 sq mi (87.99%)
    - **SD1**: 349.17 sq mi (98.95%)
    - **SD2**: 362.95 sq mi (99.99%)
    - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.



6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.



6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	**Figure 6.4.1 Risk of Heat-Related Impacts**
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

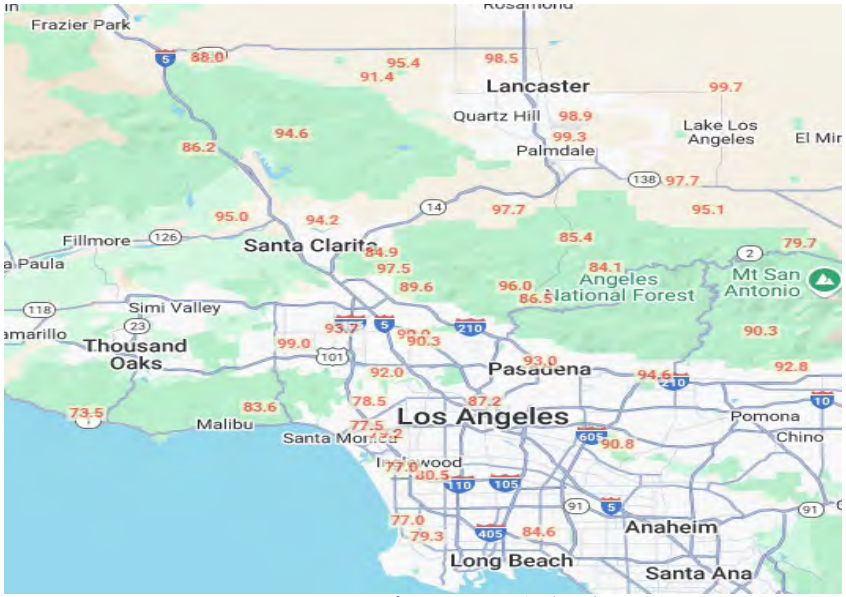


Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.



Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.



6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.



There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

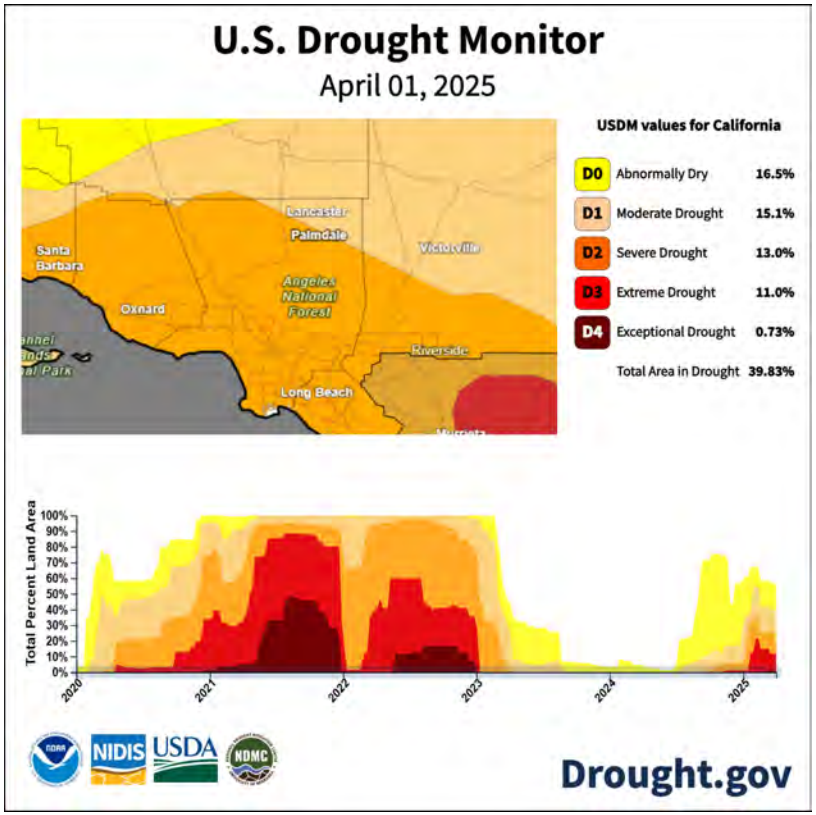


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

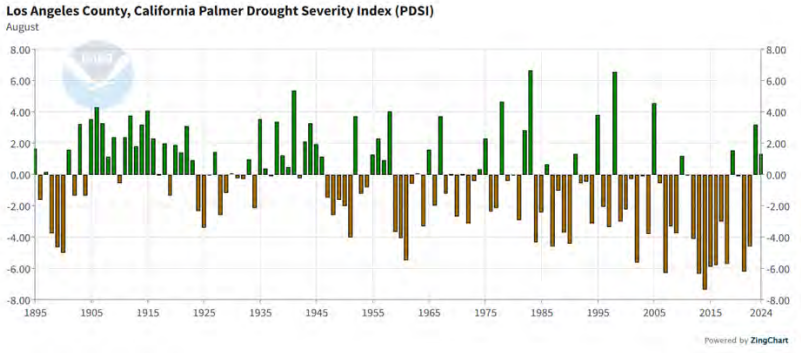


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.



6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.



Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.



6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 223.88 sq mi (7.97%)
    - **SD1**: 162.25 sq mi (45.98%)
    - **SD2**: 66.57 sq mi (18.32%)
    - **SD3**: 25.76 sq mi (5.97%)
    - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
    - Fire Department: 112 (33.22%)
    - Public Works: 92 (40.00%)
    - Health Services: 29 (44.62%)
    - Public Health: 17 (42.50%)
    - Libraries: 30 (34.48%)
    - Parks: 65 (35.50%)
    - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness–making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.



6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.



Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

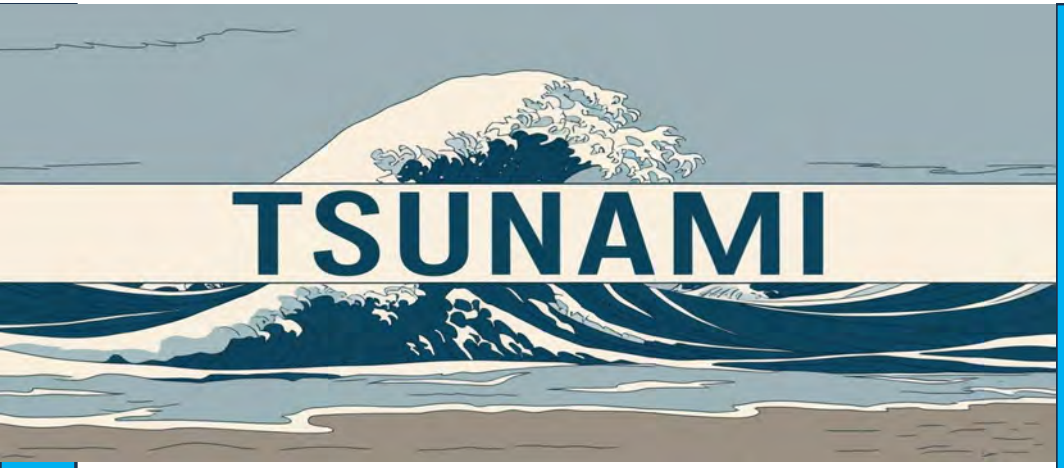
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

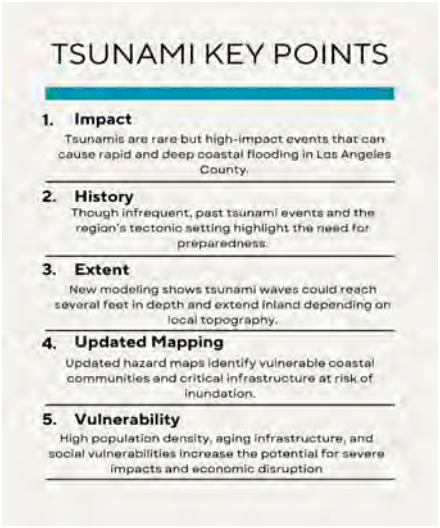
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map—developed using enhanced modeling techniques and updated coastal geomorphology data—highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.



6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.



Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023** (**DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

6.10.9 Summary

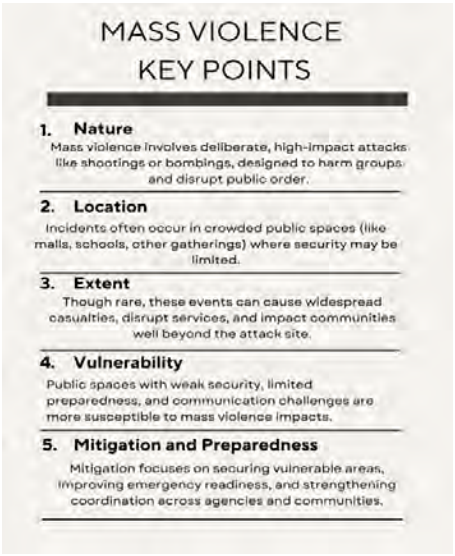
Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.



6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.



- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.



6.12 Cybersecurity Incidents

6.12.1 Nature



Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:

- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents—both in terms of economic impact and service disruption—highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.



6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

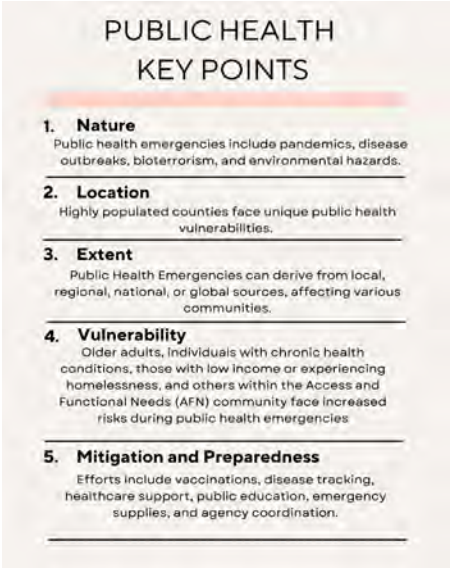
- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.



6.14 Public Health Emergencies

6.14.1 Nature



Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

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7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* **Land Movement** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.	*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**
Source: Los Angeles County Department of Public Works	
Type: Structural and Infrastructure Projects	
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.	*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**
Source: Los Angeles County Department of Public Works, among others.	
Type: Natural Systems Protections	
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.	*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.	*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works	
Type: Education and Awareness Programs	
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.	*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.	*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		*S****evere Wind/Tornado***				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	**Earthquake** **Dam Failure**	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	**Drought**	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	**Drought**	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	**Extreme Heat**	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	**Flooding** **Tsunami**	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	**Mass Violence** **Cyber Incidents**	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	**Mass Violence** **Cyber Incidents**	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	**Mass Violence**	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	**Extreme Heat**	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	**Public Health Emergencies**	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	**Wildfire** **Mass Violence**	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the

incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

G

2025 RUWMP Part 4
Rowland Water District
Appendix G

G1: UWMP Compliance Checklist

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Part 2 Chapter 7 Part 1 Chapter 3
x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Part 2 Chapter 7 Executive Summary
x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Part 2 Chapter 7
x	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Part 2 Chapter 7 Section 2.1
x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Part 2 Chapter 7
x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Part 2 Chapter 7
x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Part 2 Chapter 7 Section 9 Part 4 Appendix G-2
x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Part 4 Appendix G-2
x	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Part 1 Chapter 5
n/a	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	n/a
x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Part 2 Chapter 7 Section 1.1
x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Part 2 Chapter 7 Section 1.1
x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Part 2 Chapter 7 Section 1.1
x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Part 2 Chapter 7 Section 1.1
x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Part 2 Chapter 7 Section 1.1
x	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Part 2 Chapter 7 Section 2
x	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Part 2 Chapter 7 Section 2.1.3
x	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Part 2 Chapter 7 Section 2.1.3
x	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Part 2 Chapter 7 Section 2.3
x	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Part 2 Chapter 7 Section 2.2
x	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Part 2 Chapter 7 Section 2.2
x	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Part 2 Chapter 7 Section 2

x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Part 2 Chapter 7 Section 2.4 Part 1 Chapter 5
n/a	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	n/a
x	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Part 2 Chapter 7 Section 3
x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Part 2 Chapter 7 Section 4 Part 1 Chapter 3
x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Part 2 Chapter 7 Section 4 Part 2 Chapter 7 Section 5.3 Part 1 Chapter 5 Section 2
x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Part 2 Chapter 7 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Part 2 Chapter 7 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Part 2 Chapter 7 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Part 2 Chapter 7 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Part 2 Chapter 7 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Part 2 Chapter 7 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Part 2 Chapter 7 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Part 2 Chapter 7 Section 4.8
x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Part 2 Chapter 7 Section 4.8 Part 1 Chapter 3 Part 1 Chapter 5
x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Part 2 Chapter 7 Section 4.6
x	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Part 2 Chapter 7 Section 4.5

x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Part 2 Chapter 7 Section 4.5
x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Part 2 Chapter 7 Section 4.5.1
x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Part 2 Chapter 7 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Part 2 Chapter 7 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Part 1 Chapter Section 5
x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Part 1 Chapter 3 Section 8
x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Part 2 Chapter 1 Section 4.7 Part 1 Chapter 3 Section 9
x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Part 2 Chapter 7 Section 4.9 Part 4 Appendix G
x	7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Part 2 Chapter 7 Section 5 Part 1 Chapter 3
x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Part 2 Chapter 7 Section 5.3 Part 1 Chapter 5 Section 2
x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Part 1 Chapter 3
x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Part 2 Chapter 7 Section 2.4 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Part 2 Chapter 7 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Part 2 Chapter 7 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Part 2 Chapter 7 Section 5.1 Part 1 Chapter 5
x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Part 4 Appendix G-7

x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Part 4 Appendix G-7
x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Part 4 Appendix G-7
x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Part 4 Appendix G-7
x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Part 4 Appendix G-7
x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Part 4 Appendix G-7
x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Part 4 Appendix G-7
x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Part 4 Appendix G-7
x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies*.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought*.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Part 4 Appendix G-7
x	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Part 2 Chapter 7 Section 8

n/a	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	n/a
x	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9
x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Part 2 Chapter 7 Section 9 Part 4 Appendix G-2
x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9
x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix G-3
x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Part 4 Appendix G-3
x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix G-3
x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9
x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9
x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9
x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9
x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9
x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9
x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 7 Section 9

G2: Public Outreach

G2: Attachment 1 – 60 Day Notices

Document is available online. Select the link below to view:

Reports and Plans.

G2: Attachment 2 – Regional Workshop #1 Materials

Document is available online. Select the link below to view:

Reports and Plans.

G2: Attachment 3 – Regional Workshop #2 Materials

Document is available online. Select the link below to view:

Reports and Plans.

G3: Resolutions

G3: Attachment 1 – Adoption Resolution

RESOLUTION NO. 5-2026

RESOLUTION OF THE BOARD OF DIRECTORS OF THE ROWLAND WATER DISTRICT ADOPTING THE 2025 REGIONAL URBAN WATER MANAGEMENT PLAN

WHEREAS, The California Urban Water Management Planning Act, (Wat. Code § 10610, et seq. (the Act)), mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare, and adopt a Regional Urban Water Management Plan (Plan); and

WHEREAS, the Act generally requires that said Plan be updated and adopted at least once every five years on or before July 1, in years ending in six and one; and

WHEREAS, pursuant to recent amendments to the Act, urban water suppliers are required to update and electronically submit their 2025 Plans to the California Department of Water Resources (DWR) by July 1, 2026; and

WHEREAS, pursuant to Water Conservation Act of 2009, also referred to as SB X7-7 (Wat. Code § 10608 et seq.), an "urban retail water supplier" is defined as a water supplier that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre feet of potable water annually at retail for municipal purposes, and an "urban wholesale water supplier" is defined as a water supplier that provides more than 3,000 acre feet of water annually at wholesale for potable municipal purposes; and

WHEREAS, meets the definition of an urban retail water supplier for purposes of the Act and SB X7-7; and

WHEREAS, Rowland Water District ("District") has prepared a 2025 Plan in accordance with the Act and SB X7-7, and in accordance with applicable legal requirements, has undertaken certain coordination, notice, public involvement, public comment, and other procedures in relation to its 2025 Plan; and

WHEREAS, in accordance with the Act and SB X7-7, the District has prepared its 2025 Plan with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its 2025 Plan, and has also utilized DWR's Urban Water Management Plan Guidebook 2025, including its related appendices, in preparing its 2025 Plan; and

5. The General Manager is hereby authorized and directed, in accordance with Water Code section 10645(a), to make the 2025 Plan available for public review at the District's offices during normal business hours or on the ROWLAND WATER DISTRICT'S website no later than thirty (30) days after filing a copy of the Plan with DWR.

6. The General Manager is hereby authorized and directed, in accordance with Water Code section 10635(c), to provide that portion of the 2025 Plan prepared pursuant to Water Code section 10635(a)-(b) to any city or county within which ROWLAND WATER DISTRICT provides water supplies no later than sixty (60) days after submitting a copy of the Plan with DWR.

8. The District's Board of Directors finds and determines that this resolution is not subject to CEQA pursuant to Water Code Section 10652 because CEQA does not apply to the preparation and adoption, including addenda thereto, of an urban water management plan. Because this resolution comprises the District's adoption of its 2025 Plan, no CEQA review is required.

9. Pursuant to CEQA, the District's Board of Directors directs staff to file a Notice of Exemption with the Los Angeles County Clerk within five (5) working days of adoption of this resolution.

10. The document and materials that constitute the record of proceedings on which this resolution and the above findings have been based are located at 3021 Fullerton Road, Rowland Heights, CA. The custodian for these records is the Board Secretary.

ADOPTED at the Regular Meeting of the Board of Directors held May 19, 2026, by the following roll call vote:

AYES:	Directors Lima, Lewis, Bellah and Hsu
NOES:	None
ABSTAIN:	None
ABSENT:	Director Lu-Yang

Anthony J. Lima
Board President

ATTEST:

Dusty Moisio
Assistant General Manager

G3: Attachment 2 – Resolution No. 11-2025

The following resolution is available online. Select the link below to view: Resolution No. 11-2025.

G4: Ordinances

The following ordinance is available online. Select the link below to view:
Ordinance No. 0-7-2018.

G5: DWR Tables

Submittal Table 2-1 Retail: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
CA1910194	Rowland Water District	13,698	9,439
	Total	**13,698**	**9,439**

Submittal Table 2-2: Plan Identification

Type of Plan	Name of Regional Alliance or RUWMP
Individual UWMP	Three Valleys Regional Urban Water Management Plan

Submittal Table 2-3: Supplier Identification

Type of Supplier	Year Type	Month and date that the year begins (mm/dd)	Units of measure used in UWMP
Supplier is a retail supplier	Fiscal Year	07/01	AF

Submittal Table 2-4 Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use.
Wholesale Water Supplier Name
Three Valleys Municipal Water District

Submittal Table 3-1 Retail: Population - Current and Projected

Category	2025	2030	2035	2040	2045	2050*(opt)*
Population Served	56,961	57,495	58,033	58,576	59,124	59,678

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual

Use Type	Additional Description (as needed)	2025 Actual Water Use Potable or Non-Potable	2025 Actual Water Use Volume (AF)
Single Family		Potable	3,777
Multi-Family		Potable	1,183
Commercial		Potable	3,745
Landscape		Potable	225
Distribution System Water Loss		Potable	509
		Subtotal Potable	9,439
		Subtotal Non-Potable	0
		Total	**9,439**

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected

Use Type	Additional Description	Projected Water Use Potable or Non-Potable (Optional)	Projected Water Use 2030 (AF)	Projected Water Use 2035 (AF)	Projected Water Use 2040 (AF)	Projected Water Use 2045 (AF)	Projected Water Use 2050 opt (AF)
Single Family		Potable	3,730	3,469	3,232	3,020	2,830
Multi-Family		Potable	1,195	1,112	1,037	970	910
Commercial		Potable	3,679	3,701	3,724	3,746	3,769
Landscape		Potable	284	247	215	187	163
Distribution System Water Loss		Potable	346	347	350	351	353
Subtotal Potable			9,234	8,877	8,558	8,275	8,025
Subtotal Non-Potable			1,033	1,127	1,220	1,309	1,397
Total			**10,267**	**10,004**	**9,777**	**9,584**	**9,421**

Submittal Table 4-3 Retail: Inclusion in Water Use Projections

Projection Item	Included in Projections?
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included In Projections?	Yes

Submittal Table 4-5 Retail: Water Loss Audit Reporting

Public Water System ID #	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910194	2020	Yes
CA1910194	2021	Yes
CA1910194	2022	Yes
CA1910194	2023	Yes
CA1910194	2024	Yes

Notes: The "Volume of Water Loss" quantities for FY 2019-20 through FY 2023-24 were obtained from the annual AWWA Water Loss Audits (and based on the combination of apparent losses and real losses). Because the AWWA water loss audits were reported on a calendar year basis, half of the water loss during each calendar year was applied to the water losses for the corresponding fiscal year (to estimate the water losses for the entire fiscal year), pursuant to direction from DWR staff. The AWWA Water Loss Audit for calendar year 2025 will be prepared by October 2026.

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard

Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System?	Real Water Loss State Water Board Standard 2028 Real Water Loss Standard per Unit per day	Real Water Loss State Water Board Standard Units for Real Water Loss	Real Water Loss Most Recent AWWA Water Loss Audit Number of Units (Connections or Miles corresponding with units selected)	Real Water Loss Most Recent AWWA Water Loss Audit Volume of Total Real Loss (AF) (from AWWA Water Loss Audit)	Real Water Loss Per Unit per Day	Apparent Water Loss State Water Board Standard 2028 Apparent Water Loss Standard per Unit per Day	Apparent Water Loss State Water Board Standard Units for Apparent Water Loss	Apparent Water Loss Most Recent AWWA Water Loss Audit Number of Connections	Apparent Water Loss Most Recent AWWA Water Loss Audit Volume of Total Apparent Loss (AF) (from AWWA Water Loss Audit)	Apparent Water Loss Per Unit per Day
CA1910194	Yes	22.3	Gallons per Service Connection per Day (GPSCD)	13,582	266	17.5	13.6	Gallons per Service Connection per Day (GPSCD)	13,582	153	10.1

Water Board's Calculated Water Loss Standards

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress

Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target?	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Actual 2025 GPCD (From SB X7-7 Compliance Form) *	Did Supplier meet the 2020 Target in 2025? *
n/a	n/a	174	145	Yes	148	Yes

Notes: n/a=Not Applicable

***** Only for suppliers that did not meet the Target in 2020

Submittal Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type	Potable or Non-Potable (OPTIONAL)	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Alluvial Basin	Potable	Central	0	0	0	0	0
Alluvial Basin	Non-Potable	Puente Basin	217	380	363	414	341
		Total	**217**	**380**	**363**	**414**	**341**

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area

Wastewater Collection Name of Wastewater Collection Agency	Wastewater Collection Wastewater Volume Metered or Estimated? Optional	Wastewater Collection Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Recipient of Collected Wastewater Name of Wastewater Treatment Plant (WWTP) and Place ID Number	Recipient of Collected Wastewater Is WWTP Located Within UWMP Area?
Sanitation Districts of Los Angeles County	Estimated	3,000	San Jose Creek Water Reclamation Plant, Place ID 260156	No
Total Wastewater Received from UWMP Service Area in 2025:		**3,000**		

Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (Optional)	2025 Volume of Wastewater Received from UWMP Service Area (AF)	Total 2025 Volume of Water Treated (AF)	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Treatment Level	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Volume (AF)	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Treatment Level	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Treatment Level	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Name of other entity
Total		**0**	**0**		**0**		**0**		**0**		**0**		**0**	

Notes: Wastewater was not treated or disposed of within the UWMP service area; therefore, this table was intentionally left blank.

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

Use Type	Potable or Non-Potable (after treatment if treated) (Optional)	Additional Information	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use Volume	Potential Recycled Water Use Narrative page number (Optional)
Landscape irrigation (exc golf courses)		Landscape irrigation, construction, cooling towers, and industrial processes	1,132	1,033	1,127	1,220	1,309	1,397		
		Subtotal Potable	0	0	0	0	0	0	0	
		Subtotal Non-Potable	1,132	1,033	1,127	1,220	1,309	1,397	0	
		Total	**1,132**	**1,033**	**1,127**	**1,220**	**1,309**	**1,397**	**0**	**0**

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual

Use Type	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Landscape irrigation (exc golf courses)	1,300	1,132
Total	**1,300**	**1,132**

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
Retrofit landscape irrigation		Ongoing	
Expanding recycled water system	Additional parks, schools, nurseries, and additional commercial landscaping areas	Ongoing	
		Total (AF)	**0**
		Unit Conversion to AF	**0**

Notes: A narrative explanation is provided in Section 4.5.1 of the UWMP.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other suppliers?	If Yes, Supplier Name	Additional Description	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AF)
Six Basins Groundwater Project	Yes	Walnut Valley Water District	Develop new extraction wells		Ongoing	Average Year	1,500
Covina Irrigating Company Interconnection	Yes	Walnut Valley Water District	Improve system interties		Ongoing	Average Year	2,000

Notes: There are future water supply projects or programs not compatible with this table; therefore, are described in narrative form in Section 4.7 of the UWMP**.**

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Description	2025 Potable or Non-Potable (after treatment if treated) (Optional)	2025 Actual Volume (AF)	2025 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Puente Basin	Non-Potable	341	
Purchased or Imported Water	Main Basin	Potable	1,344	
Purchased or Imported Water	Metropolitan Water District - Three Valleys Municipal Water District	Potable	8,095	
Recycled Water	San Jose Creek Water Treatment Plant	Non-Potable	542	
Purchased or Imported Water	Walnut Valley Water District	Non-Potable	21	
		Subtotal Potable	9,439	0
		Subtotal Non-Potable	904	0
		Total	**10,343**	**0**

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Projected Water Supply 2030 Reasonably Available Volume (AF)	Projected Water Supply 2030 Total Entitlement (AF) (Optional)	Projected Water Supply 2035 Reasonably Available Volume (AF)	Projected Water Supply 2035 Total Entitlement (AF) (Optional)	Projected Water Supply 2040 Reasonably Available Volume (AF)	Projected Water Supply 2040 Total Entitlement (AF) (Optional)	Projected Water Supply 2045 Reasonably Available Volume (AF)	Projected Water Supply 2045 Total Entitlement (AF) (Optional)	Projected Water Supply 2050 Reasonably Available Volume (AF)	Projected Water Supply 2050 Total Entitlement (AF) (Optional)
Recycled Water	Puente Basin	Non-Potable	402		399		392		382		370	
Groundwater (not desalinated)	Six Basins	Potable	700		700		700		700		700	
Groundwater (not desalinated)	Central Basin	Potable	0		957		949		941		933	
Purchased or Imported Water	Main Basin	Potable	1,101		1,092		1,073		1,047		1,012	
Purchased or Imported Water	Metropolitan Water District - Three Valleys Municipal Water District	Potable	7,433		6,128		5,836		5,588		5,380	
Recycled Water	Walnut Valley Water District	Non-Potable	15		12		12		11		11	
Recycled Water	San Jose Creek WRP	Non-Potable	616		716		816		916		1,016	
		Subtotal Potable	9,234	0	8,877	0	8,558	0	8,276	0	8,025	0
		Subtotal Non-Potable	1,033	0	1,127	0	1,220	0	1,309	0	1,397	0
		Total	**10,267**	**0**	**10,004**	**0**	**9,777**	**0**	**9,584**	**0**	**9,421**	**0**

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year	Volume Available (AF)	Percent of Average Supply
Average Year	2021-2025	10,225	100%
Single-Dry Year	2021	11,152	109%
Consecutive Dry Years 1st Year	2018	11,516	113%
Consecutive Dry Years 2nd Year	2019	10,855	106%
Consecutive Dry Years 3rd Year	2020	10,759	105%
Consecutive Dry Years 4th Year	2021	11,152	109%
Consecutive Dry Years 5th Year	2022	10,522	103%

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	10,267	10,004	9,777	9,584	9,421
Use totals	10,267	10,004	9,777	9,584	9,421
Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-4 (DWR Submittal Table 6-9R).

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	11,198	10,911	10,664	10,453	10,275
Use totals	11,198	10,911	10,664	10,453	10,275
Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-4 (DWR Submittal Table 6-9R).

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison

Year	Total Type / Difference	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	11,563	11,267	11,012	10,794	10,611
	Use totals	11,563	11,267	11,012	10,794	10,611
	Difference	**0**	**0**	**0**	**0**	**0**
Second year	Supply totals	10,900	10,620	10,380	10,175	10,002
	Use totals	10,900	10,620	10,380	10,175	10,002
	Difference	**0**	**0**	**0**	**0**	**0**
Third year	Supply totals	10,803	10,527	10,288	10,085	9,913
	Use totals	10,803	10,527	10,288	10,085	9,913
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth year	Supply totals	11,198	10,911	10,664	10,453	10,275
	Use totals	11,198	10,911	10,664	10,453	10,275
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth year	Supply totals	10,565	10,295	10,062	9,863	9,695
	Use totals	10,565	10,295	10,062	9,863	9,695
	Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-4 (DWR Submittal Table 6-9R).

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment

Totals	2026	2027	2028	2029	2030
Total Water Use (AF)	11,563	10,900	10,803	11,198	10,565
Total Supplies (AF)	11,563	10,900	10,803	11,198	10,565
Difference w/o WSCP Action (AF)	**0**	**0**	**0**	**0**	**0**

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		

Notes: The Supplier uses the standard six levels of water shortage; therefore, supplier-specific shortage levels and percentage ranges are not separately identified in this table.

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (Percentage)	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)
1	Transfers		Not applicable (see notes)	
2	Transfers		Not applicable (see notes)	
3	Transfers		Not applicable (see notes)	
4	Transfers		Not applicable (see notes)	
5	Transfers		Not applicable (see notes)	
6	Transfers		Not applicable (see notes)	

Notes: The District will consider increased production from the Main Basin, Central Basin, and Puente Basin using existing facilities to address increased demands. The District plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

Submittal Table 8-3 Retail: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
0 (No Shortage)	Landscape - Limit landscape irrigation to specific times	Volume			
0 (No Shortage)	Landscape - Restrict or prohibit runoff from landscape irrigation	Volume			
0 (No Shortage)	Other - Prohibit use of potable water for washing hard surfaces	Volume			
0 (No Shortage)	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume			
0 (No Shortage)	CII - Restaurants may only serve water upon request	Volume			
0 (No Shortage)	CII - Lodging establishment must offer opt out of linen service	Volume			
0 (No Shortage)	Expand Public Information Campaign	Volume			
1	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.	Specific days (3 days/week), schedule provided by RWD.	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.	Repair leaks or breaks within 72 hours, failure will constitute a violation	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Other - Prohibit use of potable water for construction and dust control	Volume	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.		Yes
1	Other	Volume	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.	Fire hydrant use limited to firefighting and essential public health/safety uses.	Yes
1	Expand Public Information Campaign	Volume	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.	Increased Printing/Outreach Materials	No
1	Implement or Modify Drought Rate Structure or Surcharge	Volume	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.		Yes
1	Offer Water Use Surveys	Volume	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.		No
2	Landscape - Limit landscape irrigation to specific days	Volume	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Specific days (2 days/week), schedule provided by RWD.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Repair leaks or breaks within 48 hours, failure will constitute a violation.	Yes
2	Other	Volume	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	No filling/refilling ornamental lakes or ponds except for aquatic life.	

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
2	Other	Volume	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	No vehicle washing except with bucket or shut-off nozzle hose.	Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	Volume	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Water Features or swimming pools restrictions	Yes
2	Other	Volume	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Metered reduction	Yes
2	Reduce System Water Loss	Volume	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Increase frequency of meter reading/field inspections/monitoring.	Yes
3	Other	Volume	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	All actions under Shortage Level 2.	Yes
3	Landscape - Other landscape restriction or prohibition	Volume	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	Specific days (1 day/week), schedule provided by RWD.	Yes
3	Other - Require automatic shut of hoses	Volume	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.		Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	Repair leaks or breaks within 24 hours, failure will constitute a violation.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
3	Other	Volume	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	No new potable water service.	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Volume	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.		Yes
3	Increase Water Waste Patrols	Volume	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	Increase personnel to assist with water waste patrols	Yes
4	Other	Volume	Collective reduction from all Shortage Level 4 actions is up to 40% of normal water demand.	All actions under Shortage Level 3.	Yes
4	Landscape - Prohibit certain types of landscape irrigation	Volume	Collective reduction from all Shortage Level 4 actions is up to 40% of normal water demand.	Discontinue residential irrigation meters except: residential, functional landscape, and slopes/fire protection.	Yes
5	Other	Volume	Collective reduction from all Shortage Level 5 actions is up to 50% of normal water demand.	All actions under Shortage Level 4.	Yes
6	Other	Volume	Collective reduction from all Shortage Level 5 actions is greater than 50% of normal water demand.	All actions under Shortage Level 5.	Yes
6	Other	Volume	Collective reduction from all Shortage Level 5 actions is greater than 50% of normal water demand.	Appropriate restrictions will be determined and implemented in response to immediate or catastrophic supply conditions	Yes

Submittal Table 10-1 Retail: Notification to Cities and Counties

City or County Name	60 Day Notice	Notice of Public Hearing
Diamond Bar	Yes	Yes
Industry	Yes	Yes
La Habra	Yes	Yes
La Puente	Yes	Yes
Pomona	Yes	Yes
Walnut	Yes	Yes
West Covina	Yes	Yes
Whittier	Yes	Yes
Los Angeles County	Yes	Yes

G6: AWWA Water Audits

The following AWWA Water Audit reports are available online. Select the links below to view each report:

- 2020 AWWA Water Audit
- 2021 AWWA Water Audit
- 2022 AWWA Water Audit
- 2023 AWWA Water Audit
- 2024 AWWA Water Audit

If a link is not available, AWWA Water Audit reports for all years can be downloaded from the WUEdata website.

G7: Water Shortage Contingency Plan

G7: Attachment 1 – Water Shortage Contingency Plan Adoption Resolution

RESOLUTION NO. 5.1-2026

RESOLUTION OF THE BOARD OF DIRECTORS OF THE ROWLAND WATER DISTRICT ADOPTING A WATER SHORTAGE CONTINGENCY PLAN (WSCP)

WHEREAS, The California Urban Water Management Planning Act, (Wat. Code §10610, et seq. (the Act)), mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt, in accordance with prescribed requirements, a Water Shortage Contingency Plan (WSCP) as part of its Urban Water Management Plan (Plan); and

WHEREAS, the Act specifies the requirements and procedures for adopting such WSCPs; and

WHEREAS, urban water suppliers are required to adopt and electronically submit their WSCPs to the California Department of Water Resources (DWR) by July 1, 2026; and

WHEREAS, pursuant to the Act, "urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers; and

WHEREAS, Rowland Water District (District) meets the definition of an urban water supplier for purposes of the Act and is required to prepare and adopt a WSCP as part of its 2025 Plan; and

WHEREAS, the District has prepared a WSCP in accordance with the Act, and in accordance with applicable legal requirements, has undertaken certain coordination, notice, public involvement, public comment, and other procedures in relation to its WSCP; and

WHEREAS, in accordance with the Act, the District has prepared its WSCP with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its WSCP, and has also utilized DWR's Urban Water Management Plan Guidebook 2025, including its related appendices, in preparing its WSCP; and

5. The General Manager is hereby authorized and directed, in accordance with Water Code sections 10632(c) and 10645(b), to make the WSCP available to the District's customers and to the county and cities within which District provides water supplies no later than thirty (30) days after adoption, and further to make the WSCP available for public review at the District's offices during normal business hours and on its website at https://rwd.org/reports-and-plans/ no later than thirty (30) days after filing a copy of the WSCP, as part of its 2025 Plan, with DWR;

6. The General Manager is hereby authorized and directed to implement the WSCP in accordance with the Act and to provide recommendations to the Board of Directors regarding the necessary budgets, procedures, rules, regulations, or further actions to carry out the effective and equitable implementation of the WSCP.

7. The District's Board of Directors finds and determines that this resolution is not subject to CEQA pursuant to Water Code Section 10652 because CEQA does not apply to the preparation and adoption of a WSCP or to the implementation of the actions taken pursuant to a WSCP. Because this resolution comprises the District's Board of Director's adoption of its WSCP and involves its implementation, no CEQA review is required.

8. Pursuant to CEQA, the District's Board of Directors directs staff to file a Notice of Exemption with the Los Angeles County Clerk's Office within five (5) working days of adoption of this resolution.

9. The document and materials that constitute the record of proceedings on which this resolution and the above findings have been based are located at 3021 Fullerton Road, Rowland Heights, CA. The custodian for these records is the Board Secretary.

ADOPTED at the Regular Meeting of the Board of Directors held May 19, 2026, by the following roll call vote:

AYES:	Directors Lima, Lewis, Bellah and Hsu
NOES:	None
ABSTAIN:	None
ABSENT:	Director Lu-Yang

Anthony J. Lima
Board President

ATTEST:

Dusty Moisio, Assistant General Manager

G7: Attachment 2 – Water Shortage Contingency Plan

2025 WATER SHORTAGE CONTINGENCY PLAN

ROWLAND WATER DISTRICT

ACRONYMS AND ABBREVIATIONS

Acronym	Description
AF	Acre-Foot
AFY	Acre-Feet per Year
AMI	Advanced Metering Infrastructure
CDWC	California Domestic Water Company
CII	Commercial, Industrial, and Institutional
CWC	California Water Code
DWR	California Department of Water Resources
ERP	Emergency Response Plan
FY	Fiscal Year
LACSD	Los Angeles County Sanitation Districts
MWD	Metropolitan Water District of Southern California
PBWA	Pomona Basin Watermaster Authority
RRA	Risk and Resilience Assessment
RWD	Rowland Water District
SWP	State Water Project
TVMWD	Three Valleys Municipal Water District
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan

WATER SHORTAGE CONTINGENCY PLAN

LAY DESCRIPTION

WATER SHORTAGE CONTINGENCY PLAN

Rowland Water District's (RWD) 2025 Water Shortage Contingency Plan (WSCP) discusses and provides the following:

- A detailed approach which presents how RWD intends to act, or respond, in the case of an actual water shortage.
- Preparation of RWD's "Annual Water Supply and Demand Assessment" (Annual Assessment) is discussed. Since July 1, 2022, RWD has submitted the Annual Assessment each year through 2025. The Annual Assessment includes a review of RWD's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent RWD's water demands prior to any response actions RWD may invoke pursuant to RWD's WSCP.
- RWD will manage water supplies to minimize the adverse impacts of water shortages. RWD's plan for water usage during periods of shortage is designed to incorporate six standard and progressive water shortage levels including up to a 10, 20, 30, 40, and 50 percent shortage, and greater than a 50 percent shortage.
- For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level.
- For each declared water supply shortage level, RWD has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.

- The operational changes RWD will consider in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- RWD's Emergency Response Plan (ERP) is summarized. The ERP provides the management, procedures, and designated actions RWD and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of RWD's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of RWD's water service area are provided.
- The effectiveness of the shortage response actions for each of RWD's standard water shortage levels is presented. RWD has been able to provide sufficient water supplies to its customers, including during long-term droughts, and for years with historically high water demands.
- The communication protocols implemented by RWD when it declares any water shortage level are presented.
- The compliance and enforcement procedures associated with RWD's standard water shortage levels are presented.
- The legal authorities associated with RWD's standard water shortage levels are presented.
- The financial consequences associated with RWD's standard water shortage levels are presented.
- RWD will evaluate the need for revising the WSCP in order to resolve any water shortage gaps, as necessary. The steps necessary for RWD to adopt and amend its WSCP are presented.

The following WSCP includes references to Chapters and Sections from RWD's 2025 Urban Water Management Plan (UWMP):

1 WATER SUPPLY RELIABILITY ANALYSIS

CWC 10632.

(a)(1) The analysis of water supply reliability conducted pursuant to Section 10635.

RWD's sources of supply were discussed in Chapter 4 of the 2025 UWMP and consist of groundwater from Puente Basin, Main San Gabriel Basin (Main Basin), Central Basin, and treated imported water purchased from the Metropolitan Water District of Southern California (MWD) through Three Valleys Municipal Water District (TVMWD). In addition, RWD uses recycled water purchased from the Los Angeles County Sanitation Districts (LACSD). The Puente, Main, and Central Basins are adjudicated and groundwater supplies are managed. The reliability of the various sources of supply is discussed in Chapter 5 of the UWMP. Based on the 2012 amendments to the Main Basin Judgment that created a new program identified as Export and Storage. RWD through its membership in the Puente Basin Water Agency (PBWA) entered into an Export and Storage agreement with the Main Basin that allows for the storage of up to 30,000 acre feet of water. PBWA is able to purchase Teir 1 untreated water from Three Valleys MWD to be spread in the Main Basin and extracted in behalf of the members of PBWA through an agreement with California Domestic Water Company (CDWC). This water is assessed according to the terms of the Export and Storage Agreement between Main Basin and PBWA. Imported water supplies (treated) may be impacted in the event MWD implements its Water Supply Allocation Plan (WSAP) due to a water supply shortage. Section 5.3 of the UWMP summarizes RWD's projected water demands and supplies over the next 25 years in five-year increments, including during normal years, single dry years, and a five year consecutive drought period. Consequently, it is anticipated RWD will have sufficient water supplies available to meet projected demands.

2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

CWC 10632.

(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

CWC 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

Since July 1, 2022, RWD has submitted an Annual Assessment in accordance with the California Department of Water Resources' (DWR) guidance and requirements. The Annual Assessment includes a review of RWD's unconstrained water demands (i.e. water

demands prior to any projected response actions RWD may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. RWD also includes information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with RWD's WSCP.

By April of each year, RWD prepares a preliminary Annual Assessment which evaluates the adequacy of its water supplies for the current and upcoming years. The preliminary assessment includes a review of water supplies for at least a single dry year.

The components of the Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

2.1 DECISION MAKING PROCESS

RWD purchases treated imported water as its primary source of water supply. Consequently, during the third quarter of each fiscal year RWD reviews its water demands from the first two quarters along with the current groundwater basin conditions and local hydrology. This information is used to help develop the Annual Assessment. A draft of the Annual Assessment is circulated internally within RWD for peer review and comment. Based on comments received, a redraft is prepared and provided to RWD Executive Management during the spring of each year. The draft subsequently is provided to the General Manager for final review. Subsequently, a final draft of the Annual Assessment is provided to RWD's Board of Directors for review and included in the agenda as part of a Board meeting such that it can be approved, and any recommended specific shortage response actions may be enacted. The final Annual Assessment is provided to DWR no later than July 1 of each year.

The Annual Assessments are instrumental in providing guidance to RWD for decisions regarding potential declarations of a water supply shortage and implementation of water

reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process ensures adequate water supplies resources are available to RWD.

2.2 DATA AND METHODOLOGIES

The key data inputs and methodologies which are evaluated by RWD during the preparation of the preliminary assessment include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment are identified. The evaluation criteria includes, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels), current water demands, a review of water system improvement plans which may impact infrastructure availability, and water quality regulations which may impact water sources. RWD compares total demand to total supply to identify potential shortages. If shortages are identified, RWD will determine the necessary WSCP level and corresponding reduction.
2) Water Supply: A description of each available water supply source is provided. The descriptions include a quantification of each available water supply source and are based on current production capacities, historical production, UWMPs, and prior water supply studies (including Water Supply Assessments and/or Master Plans).
3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, are reviewed. The review includes factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban Water Supplier Monthly Reports, existing water shortage levels (see Section 3), and existing water conservation ordinances (see Section8.1.1 of the UWMP).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands during the current year and the upcoming (potential single dry) year are considered and identified by each type of supply. The evaluation includes factors such as estimated water demands, weather, groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.
5) Infrastructure Considerations: The capabilities of the water distribution system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year are considered. Available production capacities (e.g. groundwater well capacities) and distribution system water losses (see Section 2.1.2 of the UWMP) are reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see Section 4.7 of the UWMP), are considered.
6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies are described.

If shortages are identified, RWD will determine the necessary WSCP level and corresponding reduction.

3 SIX STANDARD WATER SHORTAGE LEVELS

CWC 10632.

(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing WSCP that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

RWD will manage water supplies prudently to minimize the adverse impacts of water shortages. RWD's plan for water usage during periods of shortage is designed to incorporate six standard and progressive water shortage levels including up to 10, 20, 30, 40, and 50 percent shortages and greater than a 50 percent shortage. Water shortage trigger mechanisms have been established to ensure that this policy is implemented.

For each declared water supply shortage level, customers will be required to reduce their water consumption by the percentage specified in the corresponding water supply shortage level. The required percentage reduction for each customer will be based on water usage during the same billing period in the last calendar year during which there were no declared water shortages.

RWD's Ordinance No. 0-7-2018 ("Establishing a Water Conservation and Water Shortage Contingency Plan"), adopted in 2018, previously established four (4) water shortage levels. A copy of Ordinance No. 0-7-2018 is provided in Appendix A. In accordance with the California Water Code (CWC) in which urban water suppliers are required to define

six standard water shortage level, RWD has developed the crosswalk illustrated below that translated RWD's previously established shortage levels to the mandated standard shortage levels. The shortage level changes were made in 2020 and have remained the same for 2025.

Corresponding Relationships Between Supplier's 2015 Shortage Levels and the 2020 WSCP Mandated Shortage Levels

Established Level	Supply Condition/Shortage
1	Up to 10 %
2	Up to 25 %
3	In excess of 25 %
4	To be determined in Special Meetings by Board of Directors

2020 Standard Level	Shortage Level
1	<10%
2	10 to 20%
3	20 to 30%
4	30 to 40 %
5	40 to 50 %
6	> 50 %

Note: The 2020 shortage levels have remained the same for 2025.

Table 1 provides a description of the six water shortage conditions which may be triggered by a shortage in one or more of RWD's water supply sources, depending on the severity of the shortage and its anticipated duration.

Table 1. Water Shortage Contingency Planning Levels

Submittal Table 1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions** ***(Narrative description)***
1	Up to 10%	Available imported water supplies are limited or restricted due to drought, regulatory restrictions, and/or the imposition of water supply allocation by MWD or TVMWD to the extent that a reduction of less than 10 percent in consumer demand is required due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation.
2	Up to 20%	Available imported water supplies are limited or restricted due to drought, regulatory restrictions, and/or the imposition of a water supply or allocation by MWD or TVMWD to the extent that 10 to 20 percent reduction in consumer demand is required due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation.
3	Up to 30%	Available imported water supplies are limited or restricted due to drought, regulatory restrictions, and/or the imposition of a water supply or allocation by MWD or TVMWD to the extent that a 20 to 30 percent reduction in consumer demand is required due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation.
4	Up to 40%	Available imported water supplies are limited or restricted due to drought, regulatory restrictions, and/or the imposition of a water supply or allocation by MWD or TVMWD to the extent that a 30 to 40 percent reduction in consumer demand is required due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation.
5	Up to 50%	Available imported water supplies are limited or restricted due to drought, regulatory restrictions, and/or the imposition of a water supply or allocation by MWD or TVMWD to the extent that a 40 to 50 percent reduction in consumer demand is required due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation.
6	>50%	In the event that an immediate water supply shortage occurs due to the breakage or failure of a dam, pump, pipeline or conduit causing an immediate emergency, the General Manager shall declare the extent of the water supply shortage emergency and, after allocating and setting aside the amount of water necessary for domestic use, sanitation and fire protection, shall determine and implement the appropriate water supply shortage restrictions.

NOTES:

4 SHORTAGE RESPONSE ACTIONS

CWC 10632.

(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

Shortage response actions are dependent on the severity of a declared shortage level. Response actions implement varying improvements and regulations of system infrastructure and operations, water supply augmentation, demand reduction initiatives and other water use functions to conserve water supplies.

4.1 DEMAND REDUCTION

Upon adoption of a water supply shortage level, the applicable mandatory water demand reduction measures will be effective immediately. A full listing of the restrictions/prohibitions associated with each shortage level is provided below.

Water Conservation Best Management Practices

RWD encourages its customers to use water efficiently, even during times of adequate supplies, and the following water conservation practices are recommended at all times.

a. Limits on Watering Hours: No watering or irrigation of lawn, landscape or other vegetated area with potable water between the hours 8:00 a.m. and 5:00 p.m.
b. Excessive Water Flow or Runoff: Eliminate watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch.
c. Washing Down of Hard or Paved Surfaces: Washing down of hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, should only be done using a bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low volume, high-pressure cleaning machine, or a low-volume high-pressure water broom.
d. Leaks and Breaks: Repair all plumbing and irrigation leaks and/or breaks as soon as reasonably possible.
e. Serving of Water at Establishments: Eating or drinking establishments, including but not limited to restaurants, hotels, cafes, bars or other public places where food or drinks are sold or served, should provide drinking water to patrons only upon request.
f. Lodging Establishments Linen Service: Hotels, motels and other commercial lodging establishments should offer customers the option of not having towels and linens laundered daily. Commercial lodging establishments should prominently display notice of this option in each bathroom using clear and easily understood language.
g. Expanding Public Information Campaign: RWD has messaging and programs/classes that notify customers to use water efficiently.

Water Supply Shortage Level 1

A Level 1 Water Supply Shortage may be declared in the event that the imported water supplies available to RWD are limited or restricted due to drought, regulatory restrictions

and/or the imposition of a water supply allocation by MWD or TVMWD up to a 10 percent reduction in consumer demand is determined to be necessary due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation. A Level 1 Water Supply Shortage shall be declared pursuant to a resolution adopted by the Board of Directors of RWD, which shall specify a mandatory conservation level of up to 10 percent. Upon the declaration by RWD of a Level 1 Water Supply Shortage condition, RWD will implement Mandatory Level 1 conservation measures identified in this section. In addition to the water conservation practices discussed above, the following water conservation requirements apply during a declared Level 1 Water Supply Shortage;

a. Limits on Watering Days: Watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to three days per week (on a schedule established and posted by RWD). Irrigation by hand-held hose equipped with a positive self-closing shut-off nozzle, drip irrigation systems when no emitter produces more than two (2) gallons per hour, or hand-held bucket or similar container is permitted.
b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks and malfunctions in the customer's plumbing must be repaired within seventy-two (72) hours of discovery. Failure to repair a leak or break within 72 hours of notification by RWD will constitute a violation.
c. Construction/Temporary Water: Potable water used on a temporary basis for construction and dust control shall be limited. Users must submit a plan which describes water use requirements to RWD for review and approval. Potable water for this purpose will be limited to that volume identified in the plan and approved by RWD. Upon availability, non-potable recycled water will be made available for these uses.
d. Fire Hydrant Use: Use of water from fire hydrants shall be limited to fire fighting and related activities, or for activities necessary to maintain the public health, safety and welfare.

e. Expanding Public Information Campaign: RWD will increase printing/outreach materials, not limited to creating new conservation programs/classes to enhance water use efficiently.
f. Offer Water Use Surveys: RWD will offer voluntary water use surveys to residential and commercial customers to identify inefficiencies and provide site-specific recommendations to reduce water use.
g. Implement or Modify Drought Rate Structure or Surcharge.
h. Metered Reduction: Water consumption as measured through the customer's meter shall be reduced by the percentage specified in the Resolution declaring the Level 1 Water Supply Shortage. The required reduction will be calculated based on the amount of water used by the same customer during the same billing period in the last calendar year during which no potable water shortage was declared. For those customers who do not have historical data upon which to base the reduction, an average consumption for the area will be used as a baseline for reduction. Metered water use in excess of the amount set forth in the Resolution will be billed at a penalty rate. That rate shall be calculated as the per unit (hundred cubic foot) cost of the penalty imposed on deliveries of potable water from TVMWD exceeding RWD's allocation. This penalty will be charged in addition to the water usage rate. At such time as the penalties imposed by TVMWD for excess use are changed, the penalty rate imposed under the Resolution will be adjusted to reflect the actual per unit cost of the penalty.

Water Supply Shortage Level 2

A Level 2 Water Supply Shortage may be declared in the event that the imported water supplies available to RWD are limited or restricted due to drought, regulatory restrictions and/or the imposition of a water supply allocation by MWD or TVMWD to the extent that up to a 20 percent reduction in consumer demand is determined to be necessary due to actual water shortages, or to avoid financial penalties for taking water in excess of the allocation. A Level 2 Water Supply Shortage shall be declared pursuant to resolution adopted by the Board of Directors of RWD, by public hearing, which shall specify a

mandatory conservation level of up to 20 percent. Upon the declaration by RWD of a Level 2 Water Supply Shortage condition, RWD will implement Mandatory Level 2 conservation measures identified in this section.

In addition to the prohibited uses of potable water identified in the Water Conservation Best Management Practices and Water Supply Shortage Level 1, the following water conservation requirements apply during a declared Level 2 Water Supply Shortage:

a. Limits on Watering Days: Watering or irrigation of lawn, landscape or other vegetated area with potable water by use of a sprinkler or soaker hose is limited to two days per week (on a schedule established and posted by RWD). Irrigation by hand-held hose equipped with a positive self-closing shut-off nozzle, drip irrigation systems when no emitter produces more than two (2) gallons per hour or hand-held bucket or similar container is permitted.
b. Water Features: Restrict water use for decorative water features, such as fountains.
c. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks and malfunctions in the customer's plumbing must be repaired within Forty-eight (48) hours of discovery. Failure to repair a leak or break within 48 hours of notification by RWD will constitute a violation.
d. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling of ornamental lakes or ponds is prohibited, except to the extent needed to sustain existing aquatic life.
e. Limits on Washing of Vehicles: Using water to wash motor vehicles, trailers, boats and other types of mobile equipment is prohibited, except with a bucket or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device.
f. Limits on Filling Residential Swimming Pools & Spas: Emptying or refilling swimming pools, spas and ponds for cleaning purposes is prohibited. Water levels may be maintained.
g. Reduce System Water Loss: RWD will increase the frequency of meter readings, field inspections, and system monitoring to identify leaks, unauthorized use, and inefficiencies, enabling timely corrective actions.

h. Metered Reduction: Water consumption as measured through the customer's meter shall be reduced by the percentage specified in the Resolution declaring the Level 2 Water Supply Shortage. The required reduction will be calculated based on the amount of water used by the same customer during the same billing period in the last calendar year during which no potable water shortage was declared. For those customers who do not have historical data upon which to base the reduction, an average consumption for the area will be used as a baseline for reduction. Metered water use in excess of the amount set forth in the Resolution will be billed at a penalty rate. That rate shall be calculated as the per unit (hundred cubic foot) cost of the penalty imposed on deliveries of potable water from TVMWD exceeding RWD's allocation. This penalty will be charged in addition to the water usage rate. At such time as the penalties imposed by TVMWD for excess use are changed, the penalty rate imposed under the Resolution will be adjusted to reflect the actual per unit cost of the penalty.

Water Supply Shortage Level 3

A Level 3 Water Supply Shortage may be declared in the event that the imported water supplies available to RWD are limited or restricted due to drought, regulatory restrictions and/or the imposition of a water supply allocation by MWD or TVMWD to the extent that a reduction of up to thirty (30) percent in consumer demand is determined to be necessary due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation. A Level 3 Water Supply Shortage shall be declared pursuant to a resolution adopted by the Board of Directors of RWD after a public hearing and shall specify a mandatory conservation level of up to 30 percent. A Level 3 Water Supply Shortage is also referred to as a "Water Shortage Emergency" condition. Upon declaration by RWD of a Level 3 Water Supply Shortage, RWD will implement Mandatory Level 3 conservation measures identified in this section.

In addition to the prohibited uses of potable water identified in the Water Conservation Best Management Practices, Water Supply Shortage Level 1, and Water Supply Shortage

Level 2, the following water conservation requirements apply during a declared Level 3 Water Shortage Emergency:

a. Limits on Watering Days: Watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to one day per week (on a schedule established and posted by RWD). Irrigation by handheld hose equipped with a positive self-closing shut-off nozzle, drip irrigation systems when no emitter produces more than two (2) gallons per hour or bucket or similar container is permitted. The restriction does not apply to the following categories.
    i. Minimum water necessary for maintenance of existing landscape necessary for fire protection and for properties adjacent to wildlands provided that such irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2 (a) and time restrictions in the Water Conservation Best Management Practices (a);
    ii. Minimum water necessary for maintenance of existing landscape for soil erosion control on slopes provided that such irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2 (a) and time restrictions in the Water Conservation Best Management Practices (a);
    iii. Maintenance of landscape within active public parks and playing fields, day care centers, golf course tee boxes and greens, and school grounds, provided that such irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2 (a) and time restrictions in Water Conservation Best Management Practices (a);
b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks and malfunctions in the customer's plumbing must be repaired within Twenty-Four (24) hours of discovery. Failure to repair a leak or break within 24 hours after notification by RWD will constitute a violation.
c. No New Potable Water Service: Upon declaration of a Level 3 Water Supply Shortage Emergency condition, no new potable water services will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide water service (such as will-

serve letters, certificates, or letters of availability) will be issued, except under the following circumstances:

i. A valid unexpired building permit has been issued for the project; or
ii. The project is necessary to protect public health, safety, and welfare; or
iii. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of RWD.

d. Other: Prohibit vehicle washing except at facilities using recycled or recirculating water.
e. Increase Water Waste Patrols: RWD will increase personnel dedicated to water waste patrols to identify violations, educate customers, and ensure compliance with water use restrictions.
f. Metered Reduction: Water consumption as measured through the customer's meter shall be reduced by the percentage specified in the Resolution declaring the Level 3 Water Supply Shortage. The required reduction will be calculated based on the amount of water used by the same customer during the same billing period in the last calendar year during which no potable water shortage was declared. For those customers who do not have historical data upon which to base the reduction, an average consumption for the area will be used as a baseline for reduction. Metered water use in excess of the amount set forth in the Resolution will be billed at a penalty rate. That rate shall be calculated as the per unit (hundred cubic foot) cost of the penalty imposed on deliveries of potable water from TVMWD exceeding RWD's allocation. This penalty will be charged in addition to the water usage rate. At such time as the penalties imposed by TVMWD for excess use are changed, the penalty rate imposed under the Resolution will be adjusted to reflect the actual per unit cost of the penalty.

<u>Water Supply Shortage Level 4</u>

A Level 4 Water Supply Shortage may be declared in the event that the imported water supplies available to RWD are limited or restricted due to drought, regulatory restrictions and/or the imposition of a water supply allocation by MWD or TVMWD to the extent that a reduction of up to forty (40) percent in consumer demand is determined to be necessary due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation. A Level 4 Water Supply Shortage shall be declared pursuant to resolution adopted by the Board of Directors of RWD after a public hearing and shall specify a mandatory conservation level of up to 40 percent. Upon the declaration by RWD of a Level 4 Water Supply Shortage condition, RWD will implement Mandatory Level 4 conservation measures.

In addition to the prohibited uses of potable water identified in the Water Conservation Best Management Practices and Water Supply Shortage Level 1 through 3 the following water conservation requirements apply during a declared Level 4 Water Shortage Emergency:

a. Limits on Watering Days: Watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to one day per week for residential customers (on a schedule established and posted by RWD). For non-residential customers, irrigation of landscape areas shall be prohibited, except for essential landscape as defined below. Essential landscape irrigation may be permitted at a reduced level, not to exceed one day per week or as otherwise directed by RWD, and is limited to the following:
    i. Landscape necessary for fire protection or located within high fire risk areas
    ii. Landscape required for erosion control on slopes
    iii. Functional landscape necessary to maintain the health and safety of the public, including active parks, school grounds, and similar public-use areas

Irrigation by handheld hose equipped with a positive self-closing shut-off nozzle, drip irrigation systems when no emitter produces more than two (2) gallons per hour or bucket or similar container is permitted. The restriction does not apply to the following

categories. All other non-essential landscape irrigation shall be **prohibited during this shortage level**.

i. Minimum water necessary for maintenance of existing landscape necessary for fire protection and for properties adjacent to wildlands provided that such irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2 (a) and time restrictions in the Water Conservation Best Management Practices (a);

ii. Minimum water necessary for maintenance of existing landscape for soil erosion control on slopes provided that such irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2(a) and time restrictions in the Water Conservation Best Management Practices (a);

iii. Maintenance of landscape within active public parks and playing fields, day care centers, golf course tee boxes and greens, and school grounds, provided that such irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2 (a) and time restrictions in Water Conservation Best Management Practices (a);

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks and malfunctions in the customer's plumbing must be repaired within Twenty-Four (24) hours of discovery. Failure to repair a leak or break within 24 hours after notification by RWD will constitute a violation.

c. Metered Reduction: Water consumption as measured through the customer's meter shall be reduced by the percentage specified in the Resolution declaring the Level 4 Water Supply Shortage. The required reduction will be calculated based on the amount of water used by the same customer during the same billing period in the last calendar year during which no potable water shortage was declared. For those customers who do not have historical data upon which to base the reduction, an average consumption for the area will be used as a baseline for reduction. Metered water use in excess of the amount set forth in the Resolution will be billed at a penalty rate. That rate shall be calculated as the per unit (hundred cubic foot) cost of the penalty imposed on deliveries of potable water from TVMWD exceeding

RWD's allocation. This penalty will be charged in addition to the water usage rate. At such time as the penalties imposed by TVMWD for excess use are changed, the penalty rate imposed under the Resolution will be adjusted to reflect the actual per unit cost of the penalty.

Water Supply Shortage Level 5

A Level 5 Water Supply Shortage may be declared in the event that the imported water supplies available to RWD are limited or restricted due to drought, regulatory restrictions and/or the imposition of a water supply allocation by MWD or TVMWD to the extent that a reduction of up to fifty (50) percent in consumer demand is determined to be necessary due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation. A Level 5 Water Supply Shortage shall be declared pursuant to resolution adopted by the Board of Directors of RWD after a public hearing and shall specify a mandatory conservation level of up to 50 percent. Upon the declaration by RWD of a Level 5 Water Supply Shortage condition, RWD will implement Mandatory Level 5 conservation measures.

In addition to the prohibited uses of potable water identified in the Water Conservation Best Management Practices and Water Supply Shortage Level 1 through 4 the following water conservation requirements apply during a declared Level 5 Water Shortage Emergency:

a. Limits on Watering Days: Watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to one day per week (on a schedule established and posted by RWD). Irrigation by handheld hose equipped with a positive self-closing shut-off nozzle, drip irrigation systems when no emitter produces more than two (2) gallons per hour or bucket or similar container is permitted. The restriction does not apply to the following categories.
    i. Minimum water necessary for maintenance of existing landscape necessary for fire protection and for properties adjacent to wildlands provided that such

irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2 (a) and time restrictions in the Water Conservation Best Management Practices (a);

ii. Minimum water necessary for maintenance of existing landscape for soil erosion control on slopes provided that such irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2 (a) and time restrictions in the Water Conservation Best Management Practices (a);

iii. Maintenance of landscape within active public parks and playing fields, day care centers, golf course tee boxes and greens, and school grounds, provided that such irrigation does not exceed two (2) days per week according to the Water Supply Shortage Level 2 (a) and time restrictions in Water Conservation Best Management Practices (a);

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks and malfunctions in the customer's plumbing must be repaired within Twenty-Four (24) hours of discovery. Failure to repair a leak or break within 24 hours after notification by RWD will constitute a violation.

c. No New Potable Water Service: Upon declaration of a Level 5 Water Supply Shortage Emergency condition, no new potable water services will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide water service (such as will-serve letters, certificates, or letters of availability) will be issued, except under the following circumstances:

i. A valid unexpired building permit has been issued for the project; or

ii. The project is necessary to protect public health, safety, and welfare; or

iii. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of RWD.

d. Metered Reduction: Water consumption as measured through the customer's meter shall be reduced by the percentage specified in the Resolution declaring the Level 5 Water Supply Shortage. The required reduction will be calculated based

on the amount of water used by the same customer during the same billing period in the last calendar year during which no potable water shortage was declared. For those customers who do not have historical data upon which to base the reduction, an average consumption for the area will be used as a baseline for reduction. Metered water use in excess of the amount set forth in the Resolution will be billed at a penalty rate. That rate shall be calculated as the per unit (hundred cubic foot) cost of the penalty imposed on deliveries of potable water from TVMWD exceeding RWD's allocation. This penalty will be charged in addition to the water usage rate. At such time as the penalties imposed by TVMWD for excess use are changed, the penalty rate imposed under the Resolution will be adjusted to reflect the actual per unit cost of the penalty.

Water Shortage Level 6

In the event that an immediate water supply shortage occurs due to the breakage or failure of a dam, pump, pipeline or conduit causing an immediate emergency, the General Manager shall declare the extent of the water supply shortage emergency and, after allocating and setting aside the amount of water necessary for domestic use, sanitation and fire protection, shall determine and implement the appropriate water supply shortage restrictions, as defined herein. The General Manager will call a special meeting of the Board of Directors as soon as practical for the purpose of reviewing and ratifying the action of the General Manager in declaring the Water Shortage Emergency.

Table 2. Water Shortage Contingency Planning Levels

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUE data online submittal tool. Select those that apply*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
0 (No Shortage)	Landscape - Limit landscape irrigation to specific times			
0 (No Shortage)	Landscape - Restrict or prohibit runoff from landscape irrigation			
0 (No Shortage)	Other - Prohibit use of potable water for washing hard surfaces			
0 (No Shortage)	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner			
0 (No Shortage)	CII - Restaurants may only serve water upon request			
0 (No Shortage)	CII - Lodging establishment must offer opt out of linen service			
0 (No Shortage)	Expand Public Information Campaign			
1	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.	Specific days (3 days/week), schedule provided by RWD.	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.	Repair leaks or breaks within 72 hours, failure will constitute a violation	Yes
1	Other - Prohibit use of potable water for construction and dust control	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.		Yes

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUE data online submittal tool. Select those that apply*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Other	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.	Fire hydrant use limited to firefighting and essential public health/safety uses.	Yes
1	Expand Public Information Campaign	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.	Increased Printing/Outreach Materials	No
1	Implement or Modify Drought Rate Structure or Surcharge	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.		Yes
1	Offer Water Use Surveys	Collective reduction from all Shortage Level 1 actions is up to 10% of total demand.		No
2	Landscape - Limit landscape irrigation to specific days	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Specific days (2 days/week), schedule provided by RWD.	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Repair leaks or breaks within 48 hours, failure will constitute a violation.	Yes
2	Other	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	No filling/refilling ornamental lakes or ponds except for aquatic life.	
2	Other	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	No vehicle washing except with bucket or shut-off nozzle hose.	Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Water Features or swimming pools restrictions	Yes
2	Other	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Metered reduction	Yes

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUE data online submittal tool. Select those that apply*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
2	Reduce System Water Loss	Collective reduction from all Shortage Level 2 actions is up to 20% of normal water demand.	Increase frequency of meter reading/field inspections/monitoring.	Yes
3	Other	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	All actions under Shortage Level 2.	Yes
3	Landscape - Other landscape restriction or prohibition	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	Specific days (1 day/week), schedule provided by RWD.	Yes
3	Other - Require automatic shut of hoses	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.		Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	Repair leaks or breaks within 24 hours, failure will constitute a violation.	Yes
3	Other	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	No new potable water service.	Yes
3	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.		Yes
3	Increase Water Waste Patrols	Collective reduction from all Shortage Level 3 actions is up to 30% of normal water demand.	Increase personnel to assist with water waste patrols	Yes
4	Other	Collective reduction from all Shortage Level 4 actions is up to 40% of normal water demand.	All actions under Shortage Level 3.	Yes

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUE data online submittal tool. Select those that apply*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
4	Landscape - Prohibit certain types of landscape irrigation	Collective reduction from all Shortage Level 4 actions is up to 40% of normal water demand.	Discontinue residential irrigation meters except: residential, functional landscape, and slopes/fire protection.	Yes
5	Other	Collective reduction from all Shortage Level 5 actions is up to 50% of normal water demand.	All actions under Shortage Level 4.	Yes
6	Other	Collective reduction from all Shortage Level 5 actions is greater than 50% of normal water demand.	All actions under Shortage Level 5.	Yes
6	Other	Collective reduction from all Shortage Level 5 actions is greater than 50% of normal water demand.	Appropriate restrictions will be determined and implemented in response to immediate or catastrophic supply conditions	Yes

NOTES:

4.2 SUPPLY AUGMENTATION

As discussed in Chapter 4 of the UWMP, RWD's sources of water supply include groundwater produced from the Main Basin, Puente Basin, and Central Basin, imported surface water purchased from MWD through TVMWD, and recycled water supplies provided by LACSD. As noted in Section 2, since July 1, 2022, RWD has prepared and submitted an Annual Assessment which includes a review of water supplies available to meet water demands for the current and upcoming years. As noted in Table 3, RWD will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. However, if RWD is currently in, or considers entering into, one of the standard water shortage levels identified in Section 3, RWD will consider the water supply (augmentation) actions described below.

For each water shortage level discussed in Section 3, RWD will consider supplementing its existing treated imported water supplies through increased production of groundwater supplies, to the extent possible. Due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies, including TVMWD. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its retail demand. The ratio of MWD water supply drought allocation to the local water supplier will change based on the WSAP stage. The MWD drought allocation can be used to make full service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any full service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

MWD's first response to any gap between core supplies (from the State Water Project (SWP) and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million acre-foot (AF). Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and on-going water supply and storage programs and management practices, RWD can potentially continue relying on purchased imported water supplies from MWD through TVMWD for supply augmentation in response to each of the standard water shortage levels identified in Section 3.

RWD will consider supplementing its existing water supplies through purchase of additional groundwater from the Main Basin. The Main Basin is managed by the Main Basin Watermaster. During the period of management under the Main Basin Judgment, significant drought events have occurred. In each drought cycle the Main Basin has been managed to maintain water levels. Parties to the Main Basin Judgment, including CDWC (from whom RWD/PBWA purchases water), are authorized to produce groundwater in excess of their rights and pay assessments for such production to the Main Basin Watermaster. The assessments are used to purchase untreated imported water to replenish the Main Basin. The Main Basin Watermaster purchases untreated imported water to replenish the Main Basin from MWD through TVMWD. An additional potential source of replenishment water is recycled water. Groundwater quality is carefully monitored and managed by the Main Basin Watermaster. Treatment facilities and/or blend plans have been developed by water agencies to meet potable water standards and to prevent the spread of any groundwater contamination. Groundwater quality in the Main Basin is not expected to impact potable supplies or constrain supply reliability. Based on historical and on-going management practices, RWD will be able to rely on the Main Basin for supplies in response to each of the standard water shortage levels identified in Section 3.

Table 2. Supply Augmentation and Other Actions

Submittal Table 8-2: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Groundwater Production Increase	≈2%	Optimize production within Main Basin, Puente Basin, and Central Basin safe yield limits
2	Implement or Modify Drought Rate Structure or Surcharge	Demand reduction support	Financial disincentives reduce demand and offset supply gap
3	Transfers	Not quantified	Participation in MWD regional transfer programs if available

Submittal Table 8-2: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
4	Emergency Interconnections	Not quantified	Activate emergency interties with neighboring agencies if needed
5	Implement or Modify Drought Rate Structure or Surcharge	Demand reduction support	Financial disincentives reduce demand and offset supply gap
6	Other	Not quantified	Emergency operational measures determined by General Manager

4.3 OPERATIONAL CHANGES

During a water supply shortage situation, RWD will manage its water supply resources to provide sufficient water supplies capable of meeting the demands of its customers. Section 4.1 describes RWD's standard water shortage levels and associated demand reduction measures. Section 4.2 describes RWD's water supply sources and water supply augmentation actions available. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in short-term operational changes which are necessary to allow RWD to utilize all available water supply sources in response to water shortage situations.

The operational changes RWD will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Increased monitoring and tracking of water demand, including more frequent (e.g., weekly or monthly) demand tracking and internal dashboard reporting to support implementation and enforcement of demand reduction measures.
- Enhanced coordination and communication with wholesale agencies, including TVMWD and MWD, through coordination meetings during shortage conditions.

- Staff reallocation to support enforcement activities, customer outreach, and public communication related to water shortage response measures.
- Enhanced field inspections, including increased monitoring of outdoor irrigation and other regulated water uses to ensure compliance with shortage restrictions.
- Improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- Optimized production from existing available water supply sources.
- Potential use of emergency supply sources, including emergency interconnections.
- Potential blending of water supply resources.
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses.

4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by RWD to reduce customer demands are discussed in Section 4.1. There are no additional mandatory restrictions planned at this time.

4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated into RWD's standard water shortage levels (identified in Section 3) and the associated demand reduction measures (described in Section 4.1). In addition to the water supply augmentation actions (Section 4.2) and potential operational changes (Section 4.3) which RWD may consider in order to continue providing sufficient water supplies, RWD will review and implement any necessary steps included in its ERP.

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including RWD, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated ERP every

five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States Environment Protection Agency (USEPA), confirming the current RRA and ERP have been reviewed and updated. For RWD, the RRA certification was due by December 31, 2025, and the ERP certification is due by June 30, 2026.

RWD's RRA, reviewed and updated in 2025, evaluates the vulnerabilities, threats, and consequences from potential hazards to RWD's water system. RWD prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and
- Operation and maintenance.

RWD's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with RWD's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

RWD's ERP, which is currently being reviewed and updated, provides the management, procedures, and designated actions RWD and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures and other unforeseen circumstances. RWD's ERP (which is incorporated by reference) provides the guidelines for evaluating an emergency situation,

procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies that directly affect the water system and the ability to maintain safe operations (such as chlorine release, earthquake, or a threat of contamination). The ERP also incorporates the results of RWD's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity
- Plans and procedures for responding to a natural hazard or malevolent act
- Actions and equipment to lessen the impact of a natural hazard or malevolent act
- Strategies to detect natural hazards or malevolent act

The ERP considers alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. RWD reviews applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC 10632.5.

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

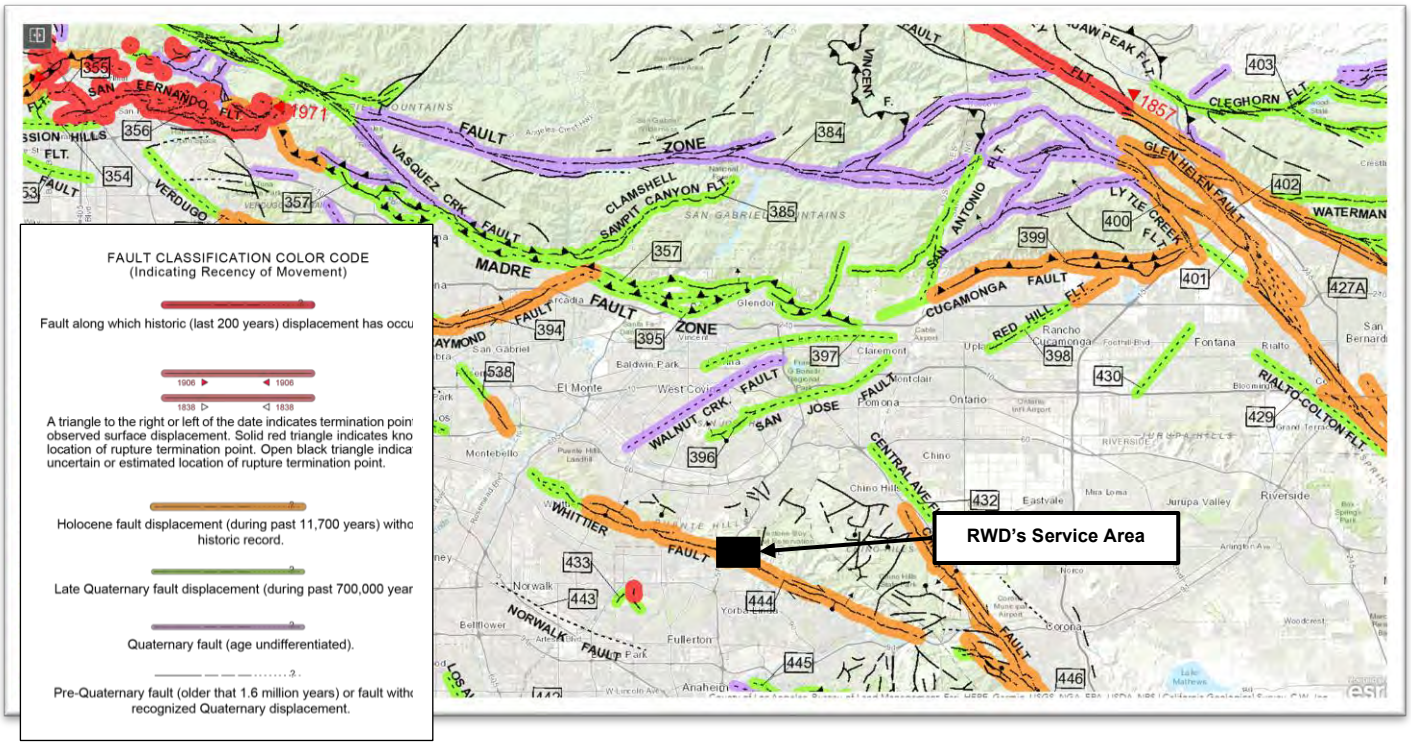
(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its UWMP as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

The County of Los Angeles prepared a “All-Hazards Mitigation Plan” in 2025 which identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Los Angeles County, and the mitigation strategies necessary to reduce risks, including seismic risk. The County’s All-Hazards Mitigation Plan is provided in Appendix B.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of RWD’s water service area are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in RWD’s water service area include the San Andreas fault, the Walnut Creek fault, the Whittier fault, the San Jose fault, the Cucamonga fault, the Chino fault, the Central Avenue fault, and the Sierra Madre fault.

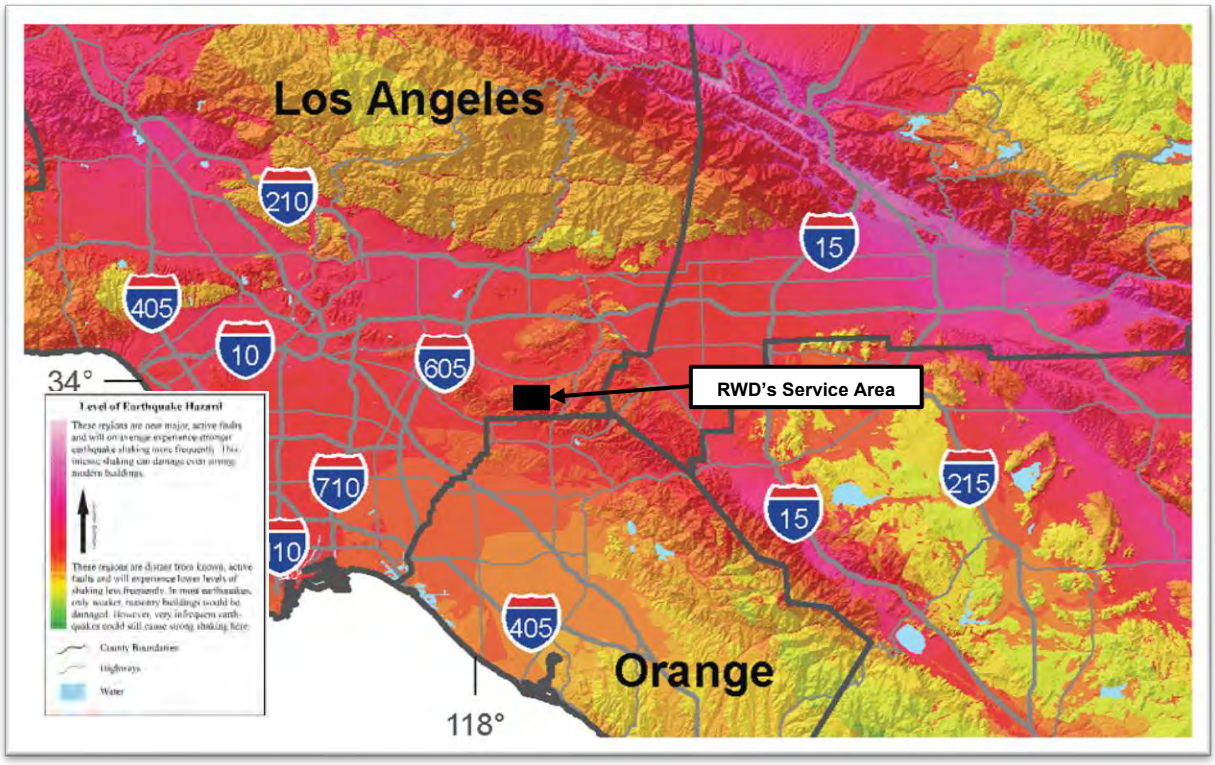
Location of Earthquake Faults



Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of RWD's service area from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including RWD's service area, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 4.5, RWD has prepared an ERP which provides the management, procedures, and designated actions RWD and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers receive a reliable and adequate supply of potable water. RWD's ERP is incorporated by reference.

Earthquake Shaking Potential



Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 3 is evident in RWD's historical ability to meet its customer's water demands in response to a water supply shortage. In addition, RWD imposes water consumption regulations and restrictions and supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of RWD's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3.

During the past 5 years, RWD experienced a consecutive two-year drought within its service area from FY 2021 to FY 2022. Throughout this extended dry year period, the RWD's annual water production averaged 10,837 acre-feet per year (AFY). During the past five years, the average annual production was approximately 10,223 AFY, with a maximum of 11,152 AF during FY 2021 to FY 2025. RWD has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, RWD has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

RWD's water demands during the most recent four years averaged approximately 8,730 AFY of potable water. Due to conservation efforts and demand management measures (discussed in Chapter 8 of the UWMP), RWD's recent water demands have been less than its historical water demands, including during long-term droughts. RWD's projected water demands (during normal, single dry, and multiple dry years) are provided in Section 5.3 of the UWMP and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. It is anticipated RWD will be able to continue providing sufficient water supplies to its customers to meet projected water demands, including during long-term droughts. In addition, as discussed in Section 4.1, based on historical and on-going management practices, RWD will be able to continue relying on its water supply sources from the Main Basin, Central Basin, and Puente Basin for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 3.

Based on RWD's ability in meeting water demands during past water supply shortages, adopted water shortage levels, adjusted operating safe yields, and long-term droughts, it is anticipated that RWD will be able to continue providing sufficient water supplies to its customers during any of its standard water shortage levels. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. RWD will enact varying levels of its WSCP to encourage retail customers to

reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of RWD's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3. The effectiveness of RWD's shortage response actions is based on RWD's water demands prior to 2015 (unconstrained demands). RWD reduced its water demands in 2015 in response to the Governor's April 1, 2015, Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. RWD's actual water demand reduction during this period was used to estimate the extent of water use reductions for RWD's Water Shortage Stages. RWD's Water Shortage Levels 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

5 COMMUNICATION PROTOCOLS

CWC 10632.

(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Pursuant to CWC 10632.1, RWD's Annual Assessment will be submitted to DWR by July 1 of each year or within 14 days of receiving its final allocation, whichever is later. The Annual Assessment provides information on RWD's anticipated shortage, triggered response actions, compliance and enforcement actions, and communication actions, as

discussed in Section 2. RWD may use the Annual Assessment as a method of declaring the appropriate water shortage level.

A water shortage level must first be adopted as a resolution during scheduled RWD board meetings. In accordance with RWD's communication protocol, for each shortage level RWD will hold a public hearing to address comments in connection with the adoption of any resolutions declaring a water shortage level. Information pertaining to the adopted resolution will be provided to the public, customers, interested parties, and local agencies through the following:

- Bill stuffers
- Website sliders
- The Rowland Quarterly newsletters
- Social media posts
- Press releases
- Newspaper publications
- On-hold messages
- Printed material placed at Customer Service Counter for distribution

The information provided will include the declared shortage level, response action associated with each shortage level, and any other relevant information relating to the resolution.

If customers violate mandatory restrictions, RWD will notify customers by issuing a Notice of Violation by mail or personal delivery within 10 days before taking enforcement action.

6 COMPLIANCE AND ENFORCEMENT

CWC 10632.

(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

RWD will ensure compliance with WSCP requirements through a combination of customer education, water use monitoring, field inspections, and enforcement actions, consistent with California Water Code Section 10632. Compliance with water shortage response actions will be monitored using the following methods:

- Customer education and communication, including outreach materials, bill inserts, the Agency website, and customer notifications describing applicable water use restrictions during declared shortage levels.
- Advanced Metering Infrastructure (AMI) and customer water use portals.
- Patrols and field inspections, conducted by staff to identify prohibited water use activities.

Metered water use in excess of the amount detailed in the resolution will be billed at a penalty rate, which will be calculated as a unit cost of the penalty imposed on deliveries of water from TVMWD exceeding RWD's allocation. This penalty will be charged in addition to customers' regular water usage rate.

In addition to the penalty rate imposed for excess water use, customers violating the mandatory prohibitions will be subject to the procedures and/or penalties as outlined in this section. A customer who repeatedly violates any of the provisions may be prosecuted as a misdemeanor punishable by imprisonment in the County jail for no more than 30 days, or by fine not exceeding one thousand dollars ($ 1,000.00) or by both.

The following tabulation outlines the procedures and penalties for violation of each declared water supply shortage level, respectively:

Water Supply Shortage Level	First Violation	Second Violation	Third Violation	Fourth Violation	Fifth Violation
Level 1	Written Notice	Final Written Notice	$ 50 Fine	$ 100 Fine	$ 150 Fine Flow Restrictor
Level 2	Written Notice	Final Written Notice	$ 50 Fine	$ 150 Fine	$ 150 Fine Flow Restrictor
Level 3, 4, 5	Written Notice	$ 50 Fine	$ 150 Fine	$ 200 Fine Flow Restrictor	Service Disconnection
Level 6	Written Notice	$ 150 Fine	$ 200 Fine Flow Restrictor	Service Disconnection	Service Disconnection

Any customer may request an adjustment or appeal to the enforced mandatory restrictions imposed under the ordinance by submitting a written application for relief to RWD. Applications must be submitted within 10 business days after receipt of the disputed billing and must include the customer's name, address, and reason for the appeal. The General Manager will review the application and determine the customers' qualification for adjustment. Filling an appeal will not prevent service disconnection or imposition of any other penalties. Water bills must be paid under protest to avoid penalties or discontinuance of service, pending conclusion of the appeals process.

7 LEGAL AUTHORITIES

CWC 10632.

(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

CWC Division 1, Section 350

The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

RWD has the legal authority to implement and enforce its WSCP. If the demand of water consumers cannot be satisfied without depleting a substantial amount of water supply needed for human consumption, sanitation, and fire protection, RWD shall declare a water shortage emergency. California Constitution article X, section 2 and CWC section 100 provide that water must be put to beneficial use, the waste or unreasonable use or unreasonable method of use of water shall be prevented, and the conservation of water is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and the public welfare. In addition, CWC Section 375 provides RWD with the statutory authority to adopt and enforce water conservation restrictions, and CWC Section 350 et seq. authorizes RWD to declare a water shortage emergency and impose water conservation measures when it determines that RWD may not be able to satisfy ordinary demands without depleting

supplies to an insufficient level. RWD shall declare a water shortage emergency in accordance with CA Water Code CHAPTER 3 - Water Shortage Emergencies § 350 – 358. Legal authorities also include California Water Code Sections 71640-71644 Article 3.

Once having declared a water shortage, RWD is provided with broad powers to implement and enforce regulations and restrictions for managing a water shortage. For example: CWC section 375(a) provides:

> Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity.

(CWC Section 375(a).) CWC Section 375(b) grants RWD with the authority to set prices to encourage water conservation.

RWD will coordinate with the County and any other entities as necessary for possible proclamation of a local emergency as necessary under California Government Code, California Emergency Services Act (Article 2, Section 8558). This includes the Cities of Industry, West Covina, and unincorporated areas of Los Angeles County including La Puente, Rowland Heights, and Hacienda Heights.

RWD adopted Ordinance No. 0-7-2018 (“Establishing a Water Conservation and WSCP”) in July 2018, pursuant the authorities described herein. The ordinance implements measures to ensure sufficient water supplies are available for sanitation, fire suppression, and domestic use. In addition, RWD must reduce its demand for imported water to avoid penalties for excessive use and ensure sufficient water supply remain for the health, safety, and welfare of the public. A copy of Ordinance No. 07-2018 is provided in

Appendix A. Ordinance No. 07-2018 supersedes RWD's Ordinance No. 0-5-2009, previously adopted in May 2009.

Upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the state will defer to implementation of locally adopted WSCPs to the extent practicable.

8 FINANCIAL CONSEQUENCES OF WSCP

CWC 10632.

(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

To ensure compliance with CWC Chapter 3.3 (commencing with Section 365), additional costs may be incurred to monitor and enforce WSCP actions. These costs may vary depending on the applicable water shortage stage and the duration of the water shortage emergency.

RWD charges a fixed rate service charge, which is independent of the quantity of water use, and a consumption charge based on the quantity of water used during the billing period. RWD operations are financed through the fixed service charge. Therefore, a decline in water demand, water supply shortages, or drastic reduction in water supply

should not adversely affect RWD's financial stability or RWD's capability to properly provide service to its customers. RWD has developed and adopted drought rate structures, which are activated during applicable water shortage stages. These drought rates are designed to offset potential revenue reductions associated with decreased water sales during drought conditions while encouraging conservation. RWD's current drought rate structure is provided in Appendix C.

If MWD imposes a drought surcharge to RWD, a strict pass-through of the charge would be implemented at the time to properly pay for the rate increase associated with the drought. RWD has an inclining Drought rate structure for specific water shortage levels (discussed in Section 3) to encourage additional water conservation.

In addition to potential revenue impacts, RWD may incur increased operational expenses during drought conditions, including costs associated with enhanced conservation outreach, customer communication, enforcement activities, consultants, temporary staffing, and related equipment or software. RWD maintains sufficient financial reserves, including a Rate Stabilization Fund, to fund these activities and sustain operations throughout water shortage conditions.

RWD has a Rate Stabilization Fund where RWD deposits surplus revenues. This helps to mitigate the loss of revenue associated with increased water conservation regulations during water shortages and minimizes impacts on customers.

9 MONITORING AND REPORTING

CWC 10632.

(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

During times of drought, RWD monitors customer water consumption to ensure its efforts are effective in reducing demand throughout its service area. Data collected will be instrumental in guiding RWD in making critical decisions and prioritizing drought response actions. In addition, RWD submits monthly Urban Water Supplier Monitoring Reports to the State Water Resources Control Board.

Customer accounts are metered and billed /monthly. Based on these records, RWD can track and assess customers' water consumption data by category, meter size, tier-width, and neighborhood, to determine whether customer groups are meeting conservation targets. If drought surcharges are implemented, billing data is assessed to determine how the surcharges affect customer demand.

RWD has fully implemented AMI, with all customers now served by smart meters. Smart meters provide multiple benefits including demand forecasting, leak detection, performance indicators, and improved reporting. By leveraging this data, RWD can monitor, identify, and target programs to specific users. This helps RWD focus conservation messaging and programs on specific groups and individual customers. Smart meters can also provide insight into when and where water is used, help to establish water budgets, provide water usage alerts, develop comparisons of water use against other customers, help with forecasting, and enable quick leak detection.

RWD has a contract for the use of water conservation and data management software. The software allows RWD to analyze total water allocation, identify large water users, and spot water use trends. The information obtained will be critical in calculating indoor and outdoor water use for complying with the recently enacted water conservation legislation (AB 1668 and SB 606).

10 WSCP REFINEMENT PROCEDURES

CWC 10632.

(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the WSCP in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

RWD's WSCP has been prepared as an adaptive management plan. As discussed in Section 9, RWD will monitor and report on the implementation of the WSCP. RWD will review the implementation results for any current or potential shortage gaps between water supplies and demands. RWD will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. RWD will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 8 of the UWMP).
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 4.1)
- Implementation of stricter enforcement actions and penalties (discussed in Section 6)
- Improvements to the water supply augmentation responses (discussed in Section 4.2), as well as any associated operational changes (discussed in Section 4.3) which may be required
- Incorporation of additional actions recommended by RWD staff or other interested parties

RWD will use the monitoring and reporting data to evaluate the ability for these potential revisions to resolve any shortage gaps which may occur within the standard water shortage levels.

This WSCP is adopted as part of RWD's 2025 UWMP adoption process discussed in Section 9.2. It is anticipated RWD will review, revise, and adopt an updated WSCP as part of preparing its 2030 UWMP as necessary. However, RWD will continue to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to RWD's WSCP will include a public hearing and adoption process by RWD's Board (see Section 12).

11 SPECIAL WATER FEATURE DISTINCTION

CWC 10632.

(b) For purposes of developing the WSCP pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

RWD's WSCP defines "decorative water features" as water features which are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water features. As a result, RWD's WSCP has reviewed the response actions, enforcement actions, and monitoring and reporting programs separately for decorative water features and for pools and spas, as applicable. During a level two water shortage, RWD restricts water use for decorative water features by prohibiting filling or refilling of ornamental lakes or ponds.

12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

CWC 10632.

(c) The urban water supplier shall make available the WSCP prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the WSCP.

CWC 10635.

(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

RWD's WSCP is adopted as part of RWD's 2020 UWMP adoption process discussed in Chapter 9 of the UWMP. The process for adopting RWD's WSCP includes the following:

- RWD will conduct a public hearing and make the WSCP available for public inspection.
- RWD will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- RWD will publish notice of public hearing in a newspaper of general circulation once a week, for two successive weeks (with at least five days between publication dates).
- RWD's Board will adopt the 2025 UWMP and the WSCP
- As part of submitting the 2025 UWMP to DWR, RWD will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2026. RWD will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, RWD will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

- RWD will conduct a public hearing and make the amended WSCP available for public inspection based on the steps identified above.
- RWD's Board will adopt the amended WSCP.
- RWD will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.
- Within 30 days after submission of the WSCP to DWR, RWD will provide the WSCP to any city or county within which RWD provides water.

Additional information regarding the adoption, submittal, and availability of RWD's WSCP (and 2025 UWMP) is provided in Chapter 9 of the UWMP.

APPENDIX A

WATER CONSERVATION AND WATER SHORTAGE CONTINGENCY PLAN

ORDINANCE NO. 0-7-2018
ROWLAND WATER DISTRICT

ESTABLISHING A WATER CONSERVATION AND WATER SHORTAGE CONTINGENCY PLAN
(Supersedes Ordinance No. 0-5-2009)

Be it ordained by the Board of Directors of the Rowland Water District (District) as follows:

Section 1: Purpose

Rowland Water District receives the majority of its potable water supplies from the Metropolitan Water District of Southern California (MWD) through MWD's member agency, Three Valleys Municipal Water District (Three Valleys). The reliability of imported water supplies have been substantially reduced due to drought and regulatory limitations to the point where MWD notified their member agencies in 2008 that due to the reduction in supplies and depletion of water storage reserves, measures have been put in place by MWD to allocate the available water supplies among their members depending upon the level of shortage, which include severe financial penalties on the retail agencies for taking water in excess of the allocated supply. The District has implemented water conservation measures, and developed a recycled water system to offset use of potable water for appropriate uses, which, although effective, may not be sufficient to stay within a reduced imported water supply allocation imposed by MWD. The Board of Directors finds that, because of the foregoing circumstances, there is currently a substantial threat and likelihood of a severe water shortage, in which the District's water supplies will be severely restricted. It is in the best interest of the residents and businesses within the District that measures are implemented to ensure that adequate supplies of water are available for domestic use, fire suppression and sanitation, and that the District, so far as possible, limits its demand for imported water to avoid penalties for excessive use and to ensure a reliable and sustainable minimum supply of water for public health, safety and welfare for all.

Section 2: Authorization and Authority

Article X, Section 2 of the California Constitution declares the general welfare requires that water resources be put to beneficial use, waste or unreasonable method of use of water be prevented, and conservation of water be fully exercised with the view to the reasonable and beneficial use thereof. Pursuant to Water Code Sections 31026 et seq., Water Code Sections 350 et seq., Water Code Sections 370 et seq., and 375 et seq., the District is authorized and empowered to enact and enforce restrictions on water use and water conservation programs to conserve its water supplies and prevent wastage.

Section 3: Declaration and Notification of Water Supply Shortage

At any time that the Board of Directors determines that the water supply available to the District is likely to be insufficient to meet the expected demands of the District's customers due to any cause, including but not limited to facility failure or reductions or allocations imposed by the District's wholesale suppliers, such that the District will not be able to supply all of the demands of its customers without incurring penalties or violating policies of the wholesale agencies, the Board may declare a water shortage. A declaration of a Level 1 or Level 2 Water Supply Shortage, as defined, shall be made at a regular or special meeting of the Board of Directors. The declaration of a Level 3 Water Supply Shortage or "Water Shortage Emergency" as authorized pursuant to Water Code Section 350, shall be made after a public hearing held pursuant to published notice, unless the Water Shortage Emergency is caused by the breakage or failure of a dam, pump, pipeline or conduit causing an immediate emergency. The Board of Directors may declare, change or rescind, as applicable, the particular stage of the water supply shortage through the adoption of a Resolution. The restrictions and mandatory reduction of use listed under each level of shortage will take effect immediately upon adoption. A full listing of the restrictions applicable to the level of shortage declared shall be published once in full in a newspaper of general circulation, printed, published and circulated in the District within fifteen (15) days after adoption of the declaration of water supply shortage. Any provisions requiring curtailment in the use of water shall become effective with the first full billing period commencing on or after the date of adoption. Notice of the activation of a water supply shortage will be included in the regular billing statement or by separate mailing to the address and customer name on record. Pursuant to and authorized by Resolution No. 2-2017, certain drought rates apply during a declared Level 1,2,3 and 4 Water Supply Shortage.

Section 4: Compliance Responsibility

The customer of the District whose name is on the account shall be responsible for compliance with the provisions of this Ordinance.

Section 5: Water Conservation Best Management Practices

The District encourages its customers to use water efficiently, even during times of adequate supplies, and the following water conservation practices are recommended at all times.

a. **Limits on Watering Hours:** **No** watering or irrigation of lawn, landscape or other vegetated area with potable water between the hours 8:00 a.m. and 5:00 p.m.

b. **Excessive Water Flow or Runoff:** Eliminate watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch.

c. **Washing Down of Hard or Paved Surfaces:** Washing down of hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, should only be done when using a bucket or similar container, a hand-

held hose equipped with a positive self-closing water shut-off device, a low volume, high-pressure cleaning machine, or a low-volume high-pressure water broom.

d. **Leaks and Breaks:** Repair all plumbing and irrigation leaks and/or breaks as soon as reasonably possible.

e. **Serving of Water at Establishments:** Eating or drinking establishments, including but not limited to restaurants, hotels, cafes, bars or other public places where food or drinks are sold or served should provide drinking water to patrons only upon request.

f. **Lodging Establishments Linen Service:** Hotels, motels and other commercial lodging establishments should offer customers the option of not having towels and linens laundered daily. Commercial lodging establishments should prominently display notice of this option in each bathroom using clear and easily understood language.

Section 6: Level 1 Water Supply Shortage

A Level 1 Water Supply Shortage may be declared in the event that the imported water supplies available to the District are limited or restricted due to drought, regulatory restrictions and/or the imposition of a water supply allocation by MWD or Three Valleys to the extent that a 5 to 15 percent reduction in consumer demand is determined to be necessary due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation. A Level 1 Water Supply Shortage shall be declared pursuant to resolution adopted by the Board of Directors of the District, which shall specify a mandatory conservation level of up to 10%. Upon the declaration by the District of a Level 1 Water Supply Shortage condition, the District will implement Mandatory Level 1 conservation measures identified in this section.

Additional Water Conservation Measures:

In addition to the water conservation practices identified in Section 5, the following water conservation requirements apply during a declared Level 1 Water Supply Shortage:

a. **Limits on Watering Days:** Watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to three days per week (**Monday, Wednesday & Friday).** Irrigation by hand-held hose equipped with a positive self-closing shut-off nozzle, drip irrigation type irrigation systems when no emitter produces more than two (2) gallons per hour, or hand-held bucket or similar container is permitted.

b. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks and malfunctions in the customer's plumbing must be repaired within seventy-two (72) hours of discovery. Failure to repair a leak or break within 72 hours of notification by the District will constitute a violation.

c. **Construction/Temporary Water:** Potable water used on a temporary basis for construction and dust control shall be limited to that quantity identified in the plan submitted by the user which describes water use requirements. The plan must be

submitted and approved by the District. Upon availability, non-potable recycled water will be made available for these uses.

d. **Fire Hydrant Use:** Use of water from fire hydrants shall be limited to fire fighting and related activities, or for activities necessary to maintain the public health, safety and welfare.

e. **Metered Reduction:** Water consumption as measured through the customer's meter shall be reduced by the customer by the percentage specified in the Resolution declaring the Level 1 Water Supply Shortage. The required reduction will be calculated based on the amount of water used by the same customer during the same billing period in the last calendar year during which no potable water shortage was declared. For those customers who do not have historical data upon which to base the reduction, an average consumption for the area will be used as a baseline for reduction. Metered water use in excess of the amount set forth in the Resolution will be billed at a penalty rate which shall be calculated as the per unit (hundred cubic foot) cost of the penalty imposed on deliveries of potable water from Three Valleys Municipal Water District exceeding Rowland Water District's allocation. This penalty will be charged in addition to the water usage rate. At such time as the penalties imposed by Three Valleys Municipal Water District for excess use are changed, the penalty rate imposed under this Water Shortage Ordinance will be adjusted to reflect the actual per unit cost of the penalty. Notice of the amount of any adjustment to the penalty rate will be given in the next billing statement after the adjustment is made.

Section 7: Level 2 Water Supply Shortage

A Level 2 Water Supply Shortage may be declared in the event that the imported water supplies available to the District are limited or restricted due to drought, regulatory restrictions and/or the imposition of a water supply allocation by MWD or Three Valleys to the extent that a 16 to 25 percent reduction in consumer demand is determined to be necessary due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation. A Level 2 Water Supply Shortage shall be declared pursuant to resolution adopted by the Board of Directors of the District, which shall specify a mandatory conservation level of up to 25%. Upon the declaration by the District of a Level 2 Water Supply Shortage condition, the District will implement Mandatory Level 2 conservation measures identified in this section.

Additional Water Conservation Measures:

In addition to the prohibited uses of potable water identified in Sections 5 and 6, the following water conservation requirements apply during a declared Level 2 Water Supply Shortage:

a. **Limits on Watering Days:** Watering or irrigation of lawn, landscape or other vegetated area with potable water by use of a sprinkler or soaker hose is limited to two days per week (**Monday & Friday).** Irrigation by hand-held hose equipped with a positive self-closing shut-off nozzle, drip irrigation type irrigation systems when no emitter produces

more than two (2) gallons per hour or hand-held bucket or similar container is permitted at other times.

b. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks and malfunctions in the customer's plumbing must be repaired within Forty-eight (48) hours of discovery. Failure to repair a leak or break within 24 hours of notification by the District will constitute a violation.

c. **Limits on Filling Ornamental Lakes or Ponds:** Filling or re-filling of ornamental lakes or ponds is prohibited, except to the extent needed to sustain existing aquatic life.

d. **Limits on Washing of Vehicles:** Using water to wash motor vehicles, trailers, boats and other types of mobile equipment is prohibited except by use with a bucket or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device.

e. **Limits on Filling Residential Swimming Pools & Spas:** Emptying or refilling swimming pools, spas and ponds for cleaning purposes is prohibited. Water levels may be maintained.

f. **Metered Reduction:** Water consumption as measured through the customer's meter shall be reduced by the customer by the percentage specified in the Resolution declaring the Level 2 Water Supply Shortage. The required reduction will be calculated based on the amount of water used by the same customer during the same billing period in the last calendar year during which no potable water shortage was declared. For those customers who do not have historical data upon which to base the reduction, an average consumption for the area will be used as a baseline for reduction. Metered water use in excess of the amount set forth in the Resolution will be billed at a penalty rate which shall be calculated as the per unit (hundred cubic foot) cost of the penalty imposed on deliveries of potable water from Three Valleys Municipal Water District exceeding Rowland Water District's allocation. This penalty will be charged in addition to the water usage rate. At such time as the penalties imposed by Three Valleys Municipal Water District for excess use are changed, the penalty rate imposed under this Water Shortage Ordinance will be adjusted to reflect the actual per unit cost of the penalty. Notice of the amount of any adjustment to the penalty rate will be given in the next billing statement after the adjustment is made.

Section 8: Level 3 Water Supply Shortage – Emergency Condition

A Level 3 Water Supply Shortage may be declared in the event that the imported water supplies available to the District are limited or restricted due to drought, regulatory restrictions and/or the imposition of a water supply allocation by MWD or Three Valleys to the extent that a reduction of greater than twenty-five (25) percent in consumer demand is determined to be necessary due to actual water shortages or to avoid financial penalties for taking water in excess of the allocation. A Level 3 Water Supply Shortage shall be declared pursuant to resolution adopted by the Board of Directors of the District after a public hearing, and shall specify a mandatory

conservation level which may be in excess of 25%. A Level 3 Water Supply Shortage condition is also referred to as a "Water Shortage Emergency" condition. Upon the declaration by the District of a Level 3 Water Supply Shortage condition, the District will implement Mandatory Level 3 conservation measures identified in this section.

Additional Water Conservation Measures:

In addition to the prohibited uses of potable water identified in Sections 5, 6 and 7, the following water conservation requirements apply during a declared Level 3 Water Shortage Emergency:

a. **Limits on Watering Days:** Watering or irrigation of lawn, landscape or other vegetated area with potable water is limited to one day per week (**Wednesday).** Irrigation by hand-held hose equipped with a positive self-closing shut-off nozzle, drip irrigation type irrigation systems when no emitter produces more than two (2) gallons per hour or bucket or similar container is permitted at other times. The restriction does not apply to the following categories.

   i. Minimum water necessary for maintenance of existing landscape necessary for fire protection and for properties adjacent to wildlands provided that such irrigation does not exceed two (2) days per week according to the Section 7 (a) and time restrictions in Section 5 (a);

   ii. Minimum water necessary for maintenance of existing landscape for soil erosion control on slopes provided that such irrigation does not exceed two (2) days per week according to the Section 7 (a) and time restrictions in Section 5 (a);

   iii. Maintenance of landscape within active public parks and playing fields, day care centers, golf course tee boxes and greens, and school grounds, provided that such irrigation does not exceed two (2) days per week according to the Section 7 (a) and time restrictions in Section 5 (a);

b. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks and malfunctions in the customer's plumbing must be repaired within Twenty-Four (24) hours of discovery. Failure to repair a leak or break within 24 hours after notification by the District will constitute a violation.

c. **No New Potable Water Service:** Upon declaration of a Level 3 Water Supply Shortage Emergency condition, no new potable water services will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide water service (such as will-serve letters, certificates, or letters of availability) will be issued, except under the following circumstances:

   i. A valid unexpired building permit has been issued for the project; or
   ii. The project is necessary to protect the public health, safety, and welfare; or

iii. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of District.

d. **Metered Reduction:** Water consumption as measured through the customer's meter shall be reduced by the customer by the percentage specified in the Resolution declaring the Level 3 Water Supply Shortage. The required reduction will be calculated based on the amount of water used by the same customer during the same billing period in the last calendar year during which no potable water shortage was declared. For those customers who do not have historical data upon which to base the reduction, an average consumption for the area will be used as a baseline for reduction. Metered water use in excess of the amount set forth in the Resolution will be billed at a penalty rate which shall be calculated as the per unit (hundred cubic foot) cost of the penalty imposed on deliveries of potable water from Three Valleys Municipal Water District exceeding Rowland Water District's allocation. This penalty will be charged in addition to the water usage rate. At such time as the penalties imposed by Three Valleys Municipal Water District for excess use are changed, the penalty rate imposed under this Water Shortage Ordinance will be adjusted to reflect the actual per unit cost of the penalty. Notice of the amount of any adjustment to the penalty rate will be given in the next billing statement after the adjustment is made.

Section 9: Exceptions

No mandatory water conservation provisions shall apply to the following water uses:

a. Recycled water distributed through the District's recycled water distribution system and used for landscape irrigation, industrial processes, construction, dust control or other approved uses.

b. The routine and necessary use of water by a governmental entity in pursuit of its functions for protecting the public health, safety and welfare of its citizens. This exception does not apply to the use of potable water for landscape irrigation by a government agency.

c. The necessary use of water for routine maintenance, testing and/or repair of the District's distribution and storage facilities.

Section 10: Level 4 Water Shortage Emergency Response

In the event that an immediate water supply shortage occurs due to the breakage or failure of a dam, pump, pipeline or conduit causing an immediate emergency, the General Manager shall declare the extent of the water supply shortage emergency and, after allocating and setting aside the amount of water necessary for domestic use, sanitation and fire protection, shall determine and implement the appropriate water supply shortage restrictions, as defined herein. The General Manager will call a special meeting of the Board of Directors as soon as practical for the

purpose of reviewing and ratifying the action of the General Manager in declaring the Water Shortage Emergency.

Section 11: Failure to Comply

a. In addition to the penalties imposed in Sections 6(e), 7(f) and 8(e), customers violating the mandatory provisions set forth in this Ordinance, as enacted by Board Resolution declaring the specific level of Water Supply Shortage, shall be subject to the procedures and/or penalties as outlined in this section.

b. Continued violations of this Ordinance may be prosecuted as a misdemeanor punishable by imprisonment in the County jail for not more than thirty (30) days, or by fine not exceeding one thousand dollars ($1,000.00), or by both.

c. The following table outlines the procedures and penalties for each violation of each declared water supply shortage level, respectively:

Water Supply Shortage Level	First Violation	Second Violation	Third Violation	Fourth Violation	Fifth Violation
Level 1	Written Notice	Final Written Notice	$50 Fine	$100 Fine	$150 Fine Flow Restrictor
Level 2	Written Notice	Final Written Notice	$50 Fine	$150 Fine	$150 Fine; Flow Restrictor
Level 3	Written Notice	$50 Fine	$150 Fine	$200 Fine Flow Restrictor	------
Level 4	Written Notice	$150 Fine	$200 Fine Flow Restrictor	-------	------

d. **Service Disconnection:** A customer who willfully or repeatedly violates any provision of this Ordinance is subject to termination of water service by the District after notice of the violation as specified in Section 11(e).

e. **Notice and Hearing:**

i. The District will issue a Notice of Violation, as outlined in the above table by mail or personal delivery to the customer at the address currently on file at least ten (10) days before taking enforcement action. If the notice is sent via mail, it will be done in such a manner to be able to track delivery and signature of the person for which delivery is made.

ii. If personal delivery is made, the name of the person for which delivery is made will be documented including time and date.

iii. If the customer or person of suitable age is unavailable at the time of delivery, a copy of the notice may be affixed in a conspicuous location at the premises; additionally, a copy will be mailed to the customer's address on file.

iv. The notice shall contain a description of the violation, the potential penalties associated with the violation and a statement informing the customer of the right to request a waiver due to hardship or special circumstances.

v. Pending receipt of a written Notice of Violation or pending a hearing pursuant to an appeal, the District may take appropriate action to prevent the unauthorized use of water as appropriate to the nature of the violation, including termination of service for multiple violations based on the current Water Shortage Level in effect at the time.

Section 12: Request for Adjustment

a. Any customer may request an adjustment to his or her mandatory water use reduction amount, or appeal the enforcement of the mandatory restrictions imposed under this Ordinance by making a written application for relief to the District. An adjustment of a customer's mandatory water use reduction level may be granted for the following reasons:

i. The customer or a member of the customer's household has a medical condition that requires the use of an amount of water in excess of normal demand. A request for adjustment on the basis of a medical condition must be supported by the certificate of a physician which specifies the nature of the use and quantity of water required.

ii. The customer demonstrates that he or she installed conservation devices or implemented measures to substantially reduce water use at the customer's property prior to the base year on which the water use reduction level was calculated, and that those conservation measures have resulted in a reduction in the customer's water consumption of at least one unit (one hundred cubic feet) per billing period. Where such conservation has been established, the customer's base year on which the mandatory water use reduction amount is calculated shall be increased by the estimated quantity of water conserved per billing period.

iii. The customer establishes that the imposition of the mandatory water use reduction on the customer would threaten the public health or safety. Examples of threats to public health and safety include the use of water to abate an unsanitary condition, or for fire suppression.

Applications for adjustment to a customer's mandatory water use reduction levels will be reviewed by the General Manager, who shall determine whether the customer qualifies for adjustment of his or her mandatory water use reduction amount and make recommendations for the resolution of such applications in accordance with the procedures and criteria set forth in this appeals policy.

b. The application for relief may include a request that the customer be relieved, in whole or in part, from the water use reduction provisions as outlined in this Ordinance.

c. In order to be considered, an application for relief must be filed in writing with the District within ten (10) business days after receipt of the disputed billing and shall include the name and address of the party submitting the appeal, as well as a brief explanation of the basis for the appeal. No relief shall be granted unless the customer demonstrates that he or she has achieved the maximum practical reduction in water consumption. No relief shall be granted to any customer who, when requested by the General Manager, fails to provide information necessary for the resolution of the customer's application for relief.

d. The appeals procedure shall consist of the following steps:

i. The General Manager shall review the application for adjustment. If the documentation provided with the application is not adequate to establish that the customer is eligible for an adjustment or the amount of the adjustment which is justified, the General Manager shall contact the applicant to request further documentation. The General Manager shall notify the customer within 5 days after documentation is completed whether the adjustment is granted and the amount of adjustment allowed. If the General Manager determines, based upon the documentation provided by the applicant that the customer does not qualify for an adjustment or qualifies for an adjustment less than that requested, the applicant may request a hearing before the General Manager, which shall be scheduled within five business days of the request. No formal rules of evidence apply. All evidence customarily relied upon by reasonable persons in the conduct of serious business affairs will be allowed, and the customer may present any such evidence which would support the grant of relief, and evidence that the customer has not engaged in wasteful water use.

ii. Filing of an application will not prevent discontinuance of service or imposition of any other penalties. To avoid penalties or discontinuance of service, water bills must be paid under protest, pending conclusion of the appeals process. The final decision of the General Manager will be given in writing by mail to the

customer within fifteen (15) days of the appeals hearing. A customer whose request for relief has been denied in whole or in part shall have the right to appeal to the Board of Directors, provided a written request has been made within fifteen (15) days following the date of mailing of the decision rendered by the General Manager.

iii. The appeal to the Board of Directors shall be scheduled at the next public meeting of the Board which is at least seven (7) days following receipt of the request.

iv. The decision of the Board shall be final.

e. Any appeal made should state the grounds upon which it is based and what remedy, if any, the appellant seeks.

f. Appendix A is a listing of conservation measures/devices which, if implemented or installed by the customer prior to the billing period for which the allocation amount is determined, would be considered, and the estimated quantity of water conserved per measure or device.

Section 13: Severability

If any section, subsection, sentence, clause or phrase in this Ordinance is for any reason held to be invalid or unconstitutional by any court of competent jurisdiction, such decision shall not affect the validity of the remaining portion of this Ordinance.

Section 14: Effective Date

This Ordinance shall be effective immediately upon adoption and shall be published in a newspaper of general circulation and distributed within the District.

Section 15: Repeal and Rescind

Upon adoption of this Ordinance, Ordinance No. 0-5-2009 shall be repealed and rescinded.

Said ordinance was adopted, on roll call vote, at the regular meeting of the Board of Directors held July 10, 2018, by the following vote:

AYES:	Directors Lu-Yang, Lewis, Lima and Rios
NOES:	None
ABSENT:	None
ABSTAIN:	Director Bellah

I hereby certify that the foregoing is a true and correct copy of Ordinance No. 0-7-2018, adopted by the Board of Directors of the Rowland Water District at its regular meeting held on July 10, 2018.

SZU PEI LU-YANG
Board President

ATTEST:

TOM COLEMAN
Secretary

Appendix A

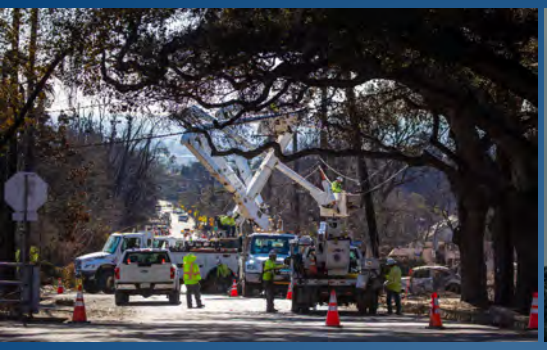
	Non-conserving		Conserving		Savings/Month ***Gallons/Hcf***
ULFT	5.5 gals x 5.2 flushes/day x 4 people= 114x 30 days=	3432gals	2.5 gals x 5.2 flushes/day x 4 people= 52 x 30 days=	1560	1,872 gallons or *2.51 hcf*
HET	2.5 gals x 5.2 flushes/day x 4 people=52 x30 days=	1560gals	1.6 gals x 5.2 flushes/day x 4 people=33 x30 days=	990	570 gallons or *.77 hcf*
DualFlush	1.6 gals x 5.2 flushes/day x 4 people=33 x30 days=	990gals	1.2 gals x 5.2 flushes/day x 4 people=25 x30 days=	749	241 gallons or *.33 hcf*
Waterless Urinals	3432 gallons per month x 12 42,000/year				3432 gallons or *4.6 hcf*
Low Flow Faucet Aerator	9.2 gals x 4 people= 37 x 30 days	1110 gals	8.0 gals x 4 people= 32 x 30 days	960	150 gallons or *.20 hcf*
Dishwasher	12 gals per load x 4 Per week x 4 weeks	192	6 gals per load 4/week x 4 weeks	96	96 gallons or *.13 hcf*
Washing Machine	40.9 gals/load x .36 loads/day= 14.8 gals x 30	444	24.3 gals/load x .38 loads/day= 9.2 gals x 30	277	167 gallons or *.23 hcf*
ET Weather-Based Controller			41 gallons/day *(Based on median lot size of 11,000 sq. ft.)*		1230 gallons or *1.65 hcf*
Rotary Sprinkler Heads (10)					333 gallons or *.45 hcf*
Artificial Turf					**Reduce** outdoor water use by 61%

APPENDIX B

COUNTY OF LOS ANGELES ALL HAZARD MITIGATION PLAN

2025 County of Los Angeles All-Hazards Mitigation Plan

Chief Executive Office - Office of Emergency Management









Acknowledgement

The Los Angeles County Board of Supervisors gratefully acknowledges the following agencies/jurisdictions who contributed to the development of this plan.

County Departments

Aging and Disabilities
Chief Executive Office
Chief Sustainability Office
Beaches and Harbors
Economic Opportunity
Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

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Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

9/9/25
Date

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1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team
	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

County of Los Angeles
All-Hazards Mitigation Plan

Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview



Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use



Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

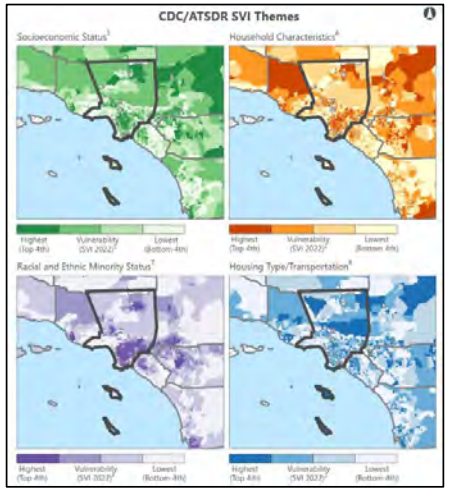


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

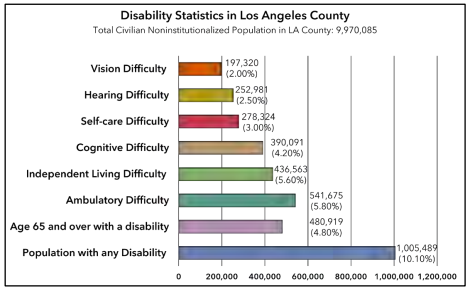


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

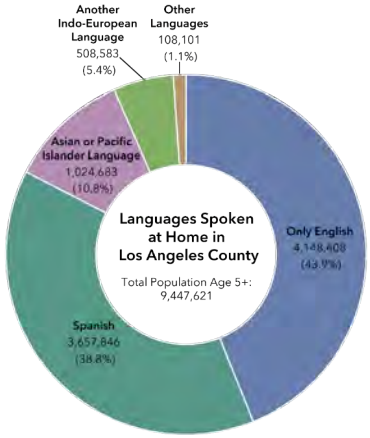


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

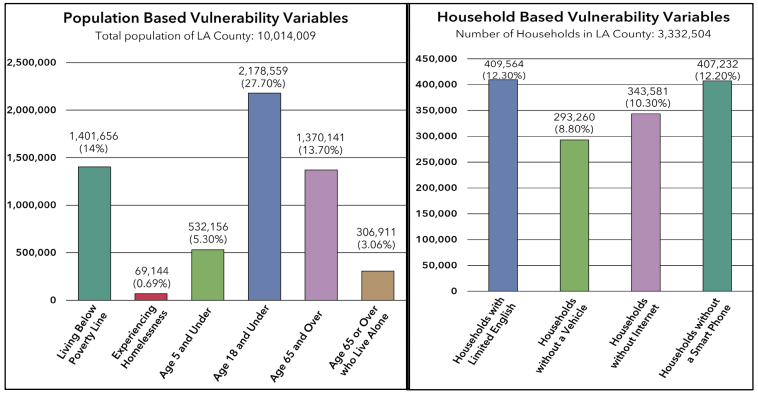


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

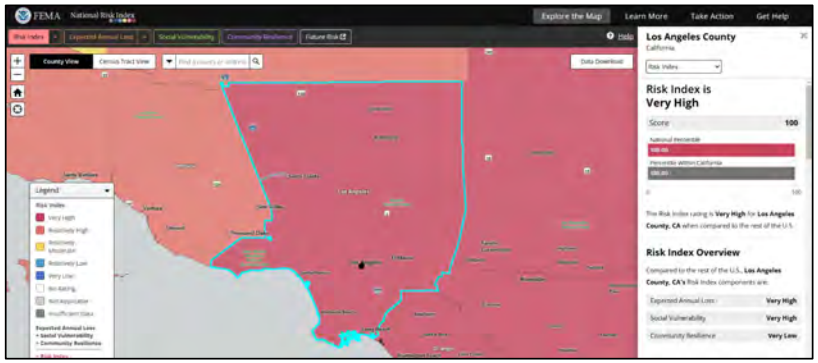


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.

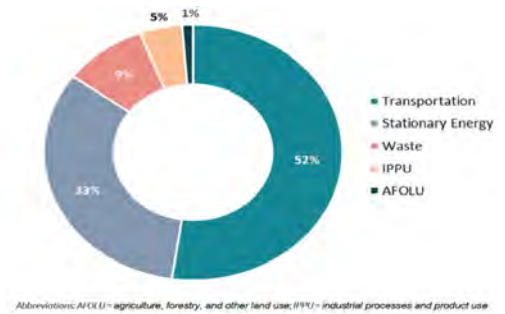


Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
  - Surveys of community needs
  - Consultations with AFN advisory groups
  - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.



- **C-MIST Explanation**
  - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
  - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
  - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
  - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
  - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.



6.2 Wildfire

6.2.1 Nature



Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows—especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD3**: 117.95 sq mi (27.29%)
    - **SD5**: 95.61 sq mi (3.36%)
    - **SD1**: 16.23 sq mi (4.60%)
    - **SD4**: 9.10 sq mi (4.27%)
    - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.



6.3 Earthquake

6.3.1 Nature



Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant. Buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 1,950.78 sq mi (69.50%)
    - **SD3**: 379.41 sq mi (87.99%)
    - **SD1**: 349.17 sq mi (98.95%)
    - **SD2**: 362.95 sq mi (99.99%)
    - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.



6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.



6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	**Figure 6.4.1 Risk of Heat-Related Impacts**
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

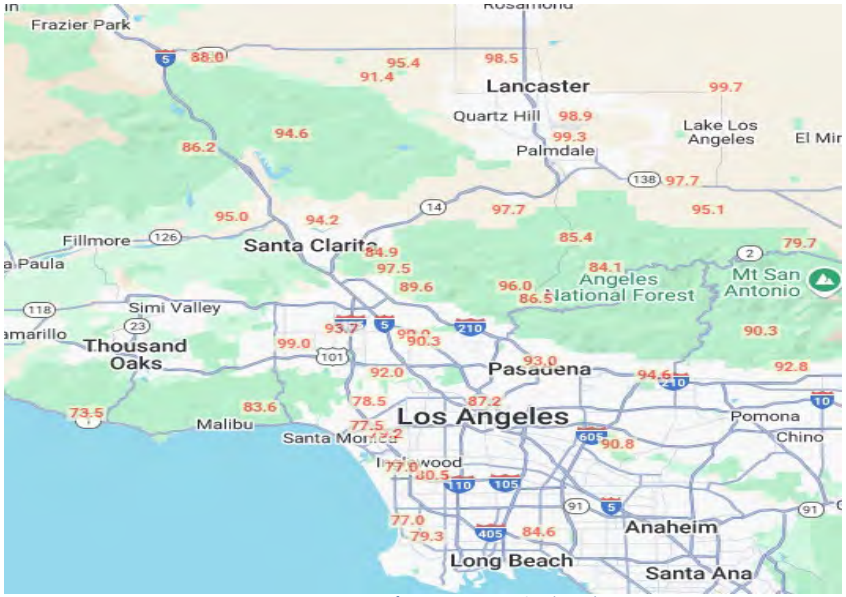


Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.



Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.



6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.



There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

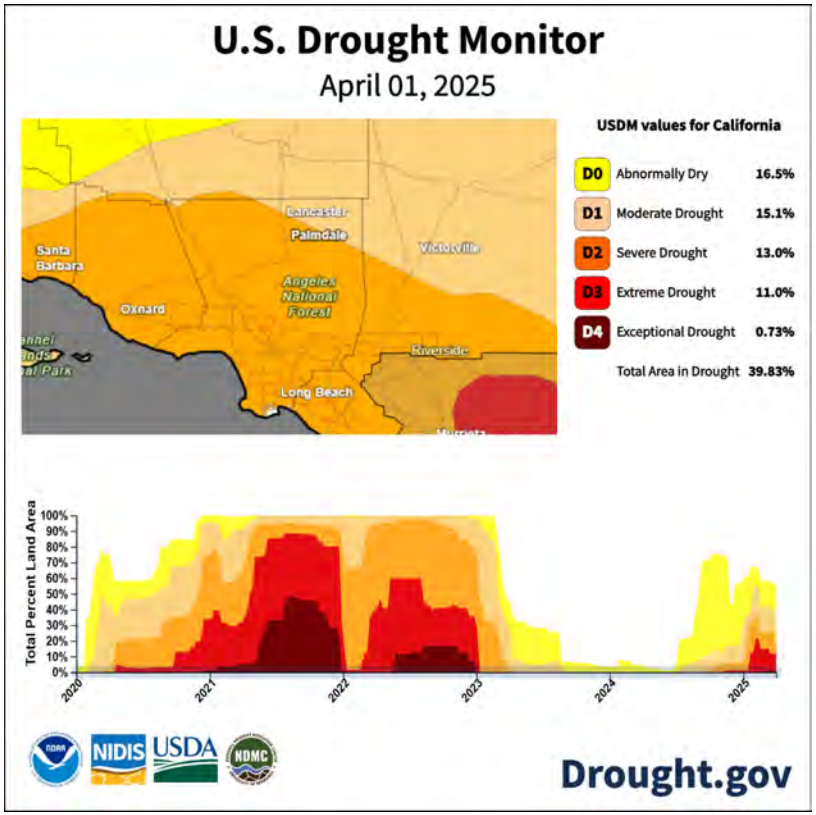


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

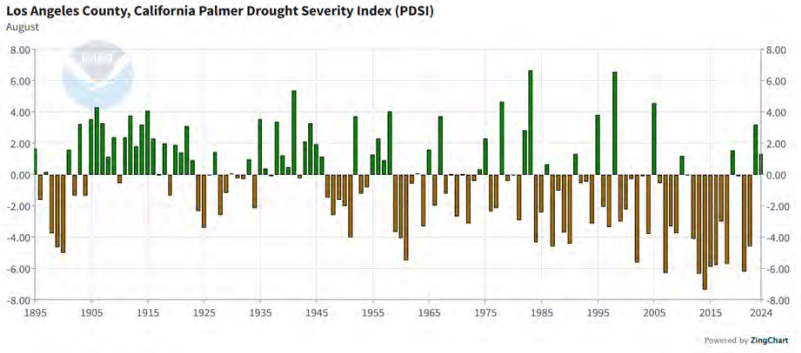


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.



6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.



Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.



6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 223.88 sq mi (7.97%)
    - **SD1**: 162.25 sq mi (45.98%)
    - **SD2**: 66.57 sq mi (18.32%)
    - **SD3**: 25.76 sq mi (5.97%)
    - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
    - Fire Department: 112 (33.22%)
    - Public Works: 92 (40.00%)
    - Health Services: 29 (44.62%)
    - Public Health: 17 (42.50%)
    - Libraries: 30 (34.48%)
    - Parks: 65 (35.50%)
    - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness–making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.



6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.



Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

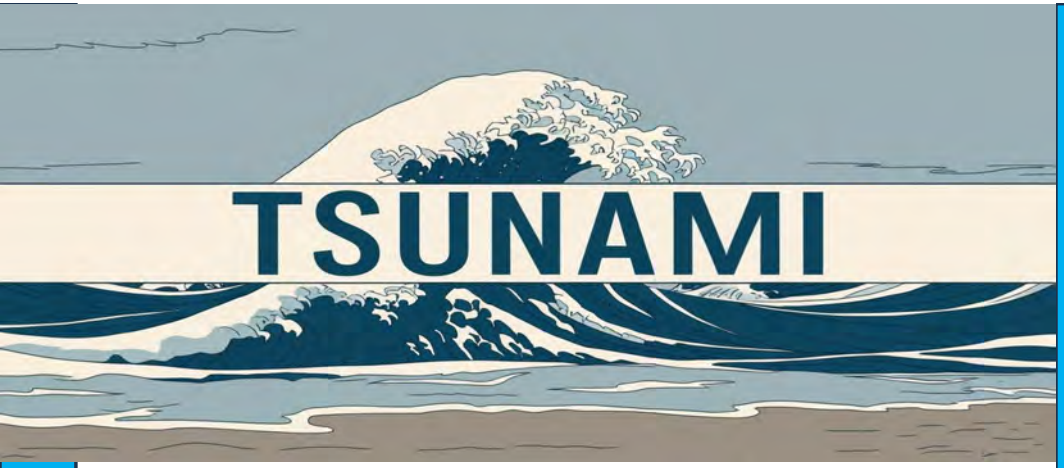
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

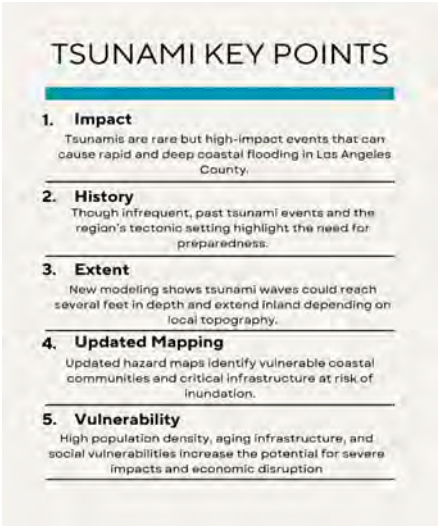
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map—developed using enhanced modeling techniques and updated coastal geomorphology data—highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.



6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.



Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023** (**DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

6.10.9 Summary

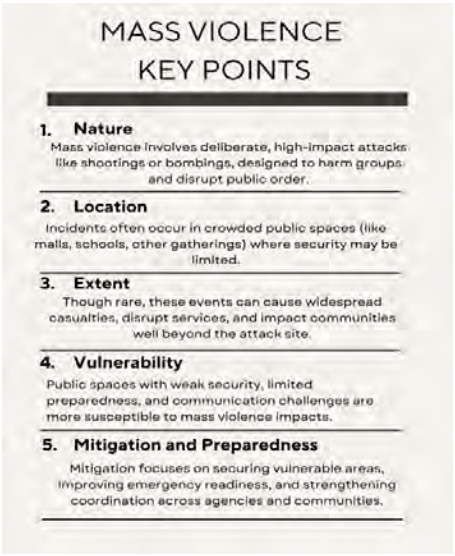
Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.



6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.



- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.



6.12 Cybersecurity Incidents

6.12.1 Nature



Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:

- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents—both in terms of economic impact and service disruption—highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.



6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

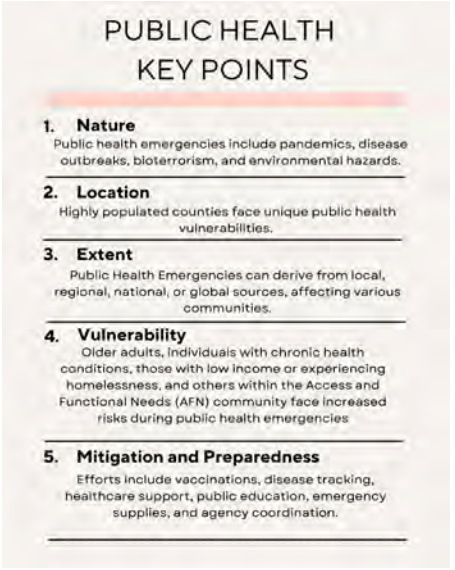
- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.



6.14 Public Health Emergencies

6.14.1 Nature



Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

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7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* **Land Movement** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.	*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**
Source: Los Angeles County Department of Public Works	
Type: Structural and Infrastructure Projects	
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.	*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**
Source: Los Angeles County Department of Public Works, among others.	
Type: Natural Systems Protections	
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.	*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.	*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works	
Type: Education and Awareness Programs	
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.	*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.	*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		*S****evere Wind/Tornado***				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	**Earthquake** **Dam Failure**	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	**Drought**	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	**Drought**	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	**Extreme Heat**	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	**Flooding** **Tsunami**	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	**Mass Violence** **Cyber Incidents**	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	**Mass Violence** **Cyber Incidents**	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	**Mass Violence**	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	**Extreme Heat**	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	**Public Health Emergencies**	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	**Wildfire** **Mass Violence**	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the

incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices

APPENDIX C

WATER RATE STRUCTURE

RESOLUTION NO. 11-2025

ROWLAND WATER DISTRICT
RESOLUTION OF THE BOARD OF DIRECTORS
ADOPTING RATES AND SERVICE CHARGES FOR
POTABLE AND RECYCLED WATER, AMENDING RESERVE POLICY
AND TAKING OTHER ACTIONS RELATING THERETO

WHEREAS, the Rowland Water District ("District") is a county water district, organized and operating pursuant to Division 12 of the California Water Code; and

WHEREAS, the District imports potable water from the Metropolitan Water District of Southern California through its member agency, Three Valleys Municipal Water District, and also owns, operates, and maintains a recycled water system that distributes recycled water to customers within the District; and

WHEREAS, the District is authorized to fix and collect charges for the provision of services and facilities, including potable and recycled water; and

WHEREAS, the District retained IB Consulting, Inc. to conduct a water rate study, and determined that it is necessary to adopt new rates for its potable and recycled water service charges to: (1) meet revenue requirements; (2) ensure revenue stability; and (3) provide adequate funding for capital improvements; and

WHEREAS, the proposed rate structure for the potable and recycled water service charges has three customer classes: Single-Family Residential Customers, All Other Customers (commercial, industrial, governmental, institutional, and multi-family residential), and Recycled Water Customers.

WHEREAS, the rate structure consists of five components: (1) fixed monthly service charges (the "Fixed Service Charges"); (2) volumetric potable water commodity charges ("Potable Water Commodity Charges"); (3) volumetric recycled water commodity charges ("Recycled Water Commodity Charges"); (4) volumetric zonal surcharges ("Zonal Surcharges"), and (5) fixed monthly fire service charges ("Fire Service Charges") (collectively herein, and together with the Water Shortage Surcharge described below, the "Charges"); and

WHEREAS, the Service Charges are fixed monthly charges established on the basis of the size of the meter serving a property and are calculated to recover the District's fixed costs of operating and maintaining the reliability of the water system, and delivering water; and

WHEREAS, the Potable Water Commodity Charges are variable charges imposed per unit of potable water delivered during a billing period. One unit equal to one hundred cubic feet ("HCF"), or 748 gallons. For Single-Family Residential Customers, the rate structure for the Potable Water Commodity Charges consists of two tiers which impose higher rates as the level of consumption increases to reflect incremental costs of providing water service. For All Other Customers, the rates for Potable Water Commodity Charges are uniform charges imposed per HCF of water delivered during a billing period.

WHEREAS, the Recycled Water Commodity Charges are variable charges imposed per unit of recycled water delivered during a billing period. The rates for Recycled Water Commodity Charges are uniform charges imposed per HCF of water delivered during a billing period; and

WHEREAS, the Zonal Surcharges are variable charges per unit of potable water delivered to customers in higher elevations across six different pressure zones and are based on the cost to maintain and pump water to customers across pressure zones; and

WHEREAS, the fire service charges ("Fire Service Charges") are fixed monthly charges established on the basis of the size of the meter supplying private fire suppression systems/hydrants; and

WHEREAS, the District is additionally proposing to adopt water shortage surcharges ("Water Shortage Surcharge"), to be imposed during periods of severe drought or water shortage emergency during which mandatory water reduction measures are implemented in order to ensure revenue sufficiency; and

WHEREAS, the Water Shortage Surcharge is a volumetric rate imposed per HCF of potable water consumption, and will vary depending on the level or percentage of water reduction required; and

WHEREAS, the District purchases water on a wholesale basis from its wholesale providers, and is subject to rate increases imposed on the District by such wholesalers; and

WHEREAS, in order to ensure revenue sufficiency in the event that such wholesalers adopt increased rates, the District will be authorized to automatically pass through any wholesale rate increase beginning January 1, 2026, and any time thereafter through and including July 1, 2030, provided such increase shall not cause the impacted rate to increase by more than 100% in any fiscal year ("Wholesale Pass-Through Adjustment"); and

WHEREAS, the proposed Charges will take effect and apply to water service on and after January 1, 2026, and will be adjusted each January 1 thereafter, through and including January 1, 2030, based on the schedule in Exhibit A; and

WHEREAS, the Charges are subject to Article XIII D, section 6 of the California Constitution ("Article XIII D"), which creates certain procedural and substantive requirements for the imposition of any new or increase in any existing property-related fees and charges, and meets these requirements as set forth below; and

WHEREAS, the revenues derived from the proposed Charges will not exceed the funds required to provide the services and shall be used exclusively for the operation and maintenance of the potable and recycled water systems; and

WHEREAS, the amount of the proposed Charges will not exceed the proportional cost of the services attributable to each parcel upon which they are proposed for imposition; and

WHEREAS, the proposed Charges will not be imposed on a parcel unless the water services are actually used by, or immediately available to, the owner of the parcel; and

WHEREAS, Article XIII D requires that prior to imposing any new Charges, the District shall provide written notice (the "Notice") by mail of the proposed Charges to the record owner of each parcel upon which the Charges are proposed for imposition and any tenant directly liable for payment of the Charges, the amount of the Charges proposed to be imposed on each parcel, the basis upon which the Charges were calculated, the reason for the Charges, and the date time and location of a public hearing (the "Hearing") on the proposed Charges; and

WHEREAS, pursuant to Article XIII D such Notice is required to be provided to the affected property owners and any tenant directly liable for the payment of the Charges not less than forty-five days prior to the Hearing on the proposed Charges; and

WHEREAS, the District did provide such Notice to the affected property owners and tenants in compliance with Article XIII D; and

WHEREAS, in accordance with Government Code section 53759.1, the District implemented an administrative remedy pursuant to which property owners and customers of record must submit legal objections prior to 5:00 PM on October 28, 2025, and the District provided responses to any valid legal objections prior to opening the Hearing; and

WHEREAS, the Board of Directors determined to open the Hearing, and the Hearing was held on this day, November 4, 2025; and

WHEREAS, at the Hearing, the Board of Directors of the District ("Board") considered all written materials and written protests to the proposed Charges received prior to the close of the Hearing, and heard oral testimony concerning the establishment and imposition of the proposed Charges, and at the close of the Hearing the District determined that it did not receive written protests against the establishment and imposition of the proposed Charges from a majority of the affected property owners or tenants directly liable for the payment of such Charges; and.

WHEREAS, the Board now desires to establish and impose the Charges as set forth in Exhibit A;

WHEREAS, the Board previously adopted a Reserve Policy pursuant to Resolution No. 7.1-2021 on July 13, 2021; and

WHEREAS, the Board has since determined that it is prudent to add an additional reserve category to the Capital Facilities Fund called the "Capital/Emergency Reserve" for emergency capital costs, and to make certain changes to the Operating Reserve.

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of the Rowland Water District as follows:

1. Incorporation of Recitals. The Recitals set forth above are made findings of this Board and are incorporated herein and made an operative part of this Resolution.

2. Inconsistency with other Fees and Charges. To the extent any Charges established by this Resolution are inconsistent with water service fees and charges previously adopted; it is the explicit intention of the Board that the Charges adopted pursuant to this Resolution shall prevail.

3. Charges. The Board hereby adopts the Charges at the rates, in the amounts, and on the effective dates set forth in Exhibit "A." The Water Shortage Surcharge may be activated as a result of a drought, a statewide order mandating water use reductions, or other natural disaster or event that results in a water shortage and an unforeseen drop in water demand. Additionally, the Board shall be authorized to implement a Wholesale Pass-Through Adjustment to account for any rate increases adopted by a wholesale water provider, commencing January 1, 2026 and any time thereafter through and including July 1, 2030. The Wholesale Pass-Through Adjustment shall not cause any impacted rate to increase by more than 100%, and shall not cause the Charges to exceed the cost of service. The District shall provide mailed notice to all impacted property owners or customers of record at least 30 days before implementing a Wholesale Pass-Through Adjustment.

4. Amendment to Reserve Policy. The Board hereby adopts the Amended and Restated Reserve Policy set forth in Exhibit "B" hereto. The Amended and Restated Reserve Policy shall supersede the Reserve Policy established pursuant to Resolution No. 7.1-2021.

5. CEQA Compliance. The Board finds that the need to meet the District's financial reserve requirements and obtain funds for capital projects, to be funded by the Charges, is necessary to maintain service within the District's existing water service area as described herein. The Board further finds that the need to meet the District's financial reserve requirements and obtain funds for capital projects, to be funded by the Charges will not expand the District's water system. The Board further finds that the adoption of the Charges is necessary and reasonable to meet the District's financial reserve requirements and obtain funds for capital projects. Based on these findings, the Board determines that the adoption of the Charges is exempt from the requirements of the California Environmental Quality Act pursuant to section 21080(b)(8) of the Public Resources Code and section 15273(a) of the State CEQA Guidelines. The documents and materials that constitute the record of proceedings on which these findings have been based are located at the Rowland Water District, 3021 Fullerton Road, Rowland Heights, CA 91748. The custodian for these records is the Board Secretary of the District. The Board hereby directs District staff to file a Notice of Exemption within five business days of the adoption of this Resolution.

6. Severability. If any section, subsection, clause or phrase in this Resolution or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of this Resolution or the application of such provisions to other persons or circumstances shall not be affected thereby. The Board hereby declares that it would have passed this Resolution and each section, subsection, sentence, clause, or phrase thereof, irrespective of

the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof to any person or circumstance be held invalid.

7. Effective Date. This Resolution shall become effective immediately upon its adoption.

ADOPTED AT A REGULAR MEETING OF THE ROWLAND WATER DISTRICT HELD November 4, 2025 by the following roll call vote:

AYES: Directors Bellah, Hsu, Lewis, Lima, Lu-Yang

NOES: None

ABSTAIN: None

ABSENT: None

JOHN BELLAH
President

ATTEST:

TOM COLEMAN
General Manager/Board Secretary

I certify that the forgoing Resolution is a true and correct copy of the Resolution of the Board of Directors of the Rowland Water District adopted on November 4, 2025.

TOM COLEMAN
General Manager/Board Secretary

EXHIBIT "A" TO RESOLUTION NO. 11-2025

Fixed charges

Potable Monthly Fixed Charge					
Meter Size	Effective January 1, 2026	Effective January 1, 2027	Effective January 1, 2028	Effective January 1, 2029	Effective January 1, 2030
5/8"	$48.03	$52.12	$56.56	$61.37	$66.59
1"	$107.69	$116.85	$126.79	$137.57	$149.27
1 1/2"	$207.11	$224.72	$243.83	$264.56	$287.05
2"	$326.42	$354.17	$384.28	$416.95	$452.40
3"	$1,002.51	$1,087.73	$1,180.19	$1,280.51	$1,389.36
4"	$1,996.76	$2,166.49	$2,350.65	$2,550.46	$2,767.25
6"	$3,189.86	$3,461.00	$3,755.19	$4,074.39	$4,420.72
8"	$5,576.06	$6,050.03	$6,564.29	$7,122.26	$7,727.66
10"	$10,945.01	$11,875.34	$12,884.75	$13,979.96	$15,168.26
12"	$10,945.01	$11,875.34	$12,884.75	$13,979.96	$15,168.26

**Single-family residential customers who have a 1" meter to meet fire flow requirements were captured under 5/8" meters to reflect the capacity these customers utilize within the system*

Recycled Monthly Fixed Charge					
Meter Size	Effective January 1, 2026	Effective January 1, 2027	Effective January 1, 2028	Effective January 1, 2029	Effective January 1, 2030
5/8"	$45.12	$48.96	$53.13	$57.65	$62.56
1"	$100.41	$108.95	$118.22	$128.27	$139.18
1 1/2"	$192.56	$208.93	$226.69	$245.96	$266.87
2"	$303.14	$328.91	$356.87	$387.21	$420.13
3"	$929.76	$1,008.79	$1,094.54	$1,187.58	$1,288.53
4"	$1,851.26	$2,008.62	$2,179.36	$2,364.61	$2,565.61
6"	$2,957.06	$3,208.42	$3,481.14	$3,777.04	$4,098.09
8"	$5,168.66	$5,608.00	$6,084.68	$6,601.88	$7,163.04
10"	$10,144.76	$11,007.07	$11,942.68	$12,957.81	$14,059.23
12"	$10,144.76	$11,007.07	$11,942.68	$12,957.81	$14,059.23

Fire Line Monthly Fixed Charge					
Connection Size	Effective January 1, 2026	Effective January 1, 2027	Effective January 1, 2028	Effective January 1, 2029	Effective January 1, 2030
5/8"	$10.48	$11.38	$12.35	$13.40	$14.54
1"	$13.81	$14.99	$16.27	$17.66	$19.17
1 1/2"	$19.36	$21.01	$22.80	$24.74	$26.85
2"	$26.02	$28.24	$30.65	$33.26	$36.09
3"	$63.76	$69.18	$75.07	$81.46	$88.39
4"	$119.26	$129.40	$140.40	$152.34	$165.29
6"	$185.86	$201.66	$218.81	$237.41	$257.59
8"	$319.06	$346.19	$375.62	$407.55	$442.20
10"	$618.76	$671.36	$728.43	$790.35	$857.53
12"	$618.76	$671.36	$728.43	$790.35	$857.53

Variable Rates

Variable Rates ($/hcf)						
Customer Class	Tiers	Effective January 1, 2026	Effective January 1, 2027	Effective January 1, 2028	Effective January 1, 2029	Effective January 1, 2030
Single-Family Residential						
Tier 1	*7*	$4.52	$4.91	$5.33	$5.79	$6.29
Tier 2	*>7*	$5.26	$5.71	$6.20	$6.73	$7.31
All Other Potable	*Uniform*	$4.52	$4.91	$5.33	$5.79	$6.29
Construction	*Uniform*	$8.49	$9.22	$10.01	$10.87	$11.80
Recycled	*Uniform*	$3.73	$4.05	$4.40	$4.78	$5.19

Pumping Rates ($/hcf)					
Pumping Zone	Effective January 1, 2026	Effective January 1, 2027	Effective January 1, 2028	Effective January 1, 2029	Effective January 1, 2030
Zone 1	$0.07	$0.08	$0.09	$0.10	$0.11
Zone 2	$0.29	$0.32	$0.35	$0.38	$0.42
Zone 3	$0.73	$0.80	$0.87	$0.95	$1.04
Zone 4	$1.33	$1.45	$1.58	$1.72	$1.87
Zone 5	$1.73	$1.88	$2.04	$2.22	$2.41
Zone 6	$2.05	$2.23	$2.42	$2.63	$2.86

Water Shortage Surcharges

Water Shortage Surcharges FY 2026						
Customer Class	**Stage 1**	**Stage 2**	**Stage 3**	**Stage 4**	**Stage 5**	**Stage 6**
Single-Family Residential						
Tier 1	$0.20	$0.44	$0.65	$0.94	$1.35	$1.95
Tier 2	$0.24	$0.51	$0.76	$1.10	$1.57	$2.27
All Other Potable	$0.20	$0.44	$0.65	$0.94	$1.35	$1.95

Water Shortage Surcharges FY 2027						
Customer Class	**Stage 1**	**Stage 2**	**Stage 3**	**Stage 4**	**Stage 5**	**Stage 6**
Single-Family Residential						
Tier 1	$0.21	$0.44	$0.66	$0.95	$1.35	$1.96
Tier 2	$0.25	$0.51	$0.76	$1.10	$1.57	$2.28
All Other Potable	$0.21	$0.44	$0.66	$0.95	$1.35	$1.96

Water Shortage Surcharges FY 2028						
Customer Class	**Stage 1**	**Stage 2**	**Stage 3**	**Stage 4**	**Stage 5**	**Stage 6**
Single-Family Residential						
Tier 1	$0.23	$0.45	$0.67	$0.97	$1.39	$2.02
Tier 2	$0.26	$0.52	$0.78	$1.13	$1.62	$2.35
All Other Potable	$0.23	$0.45	$0.67	$0.97	$1.39	$2.02

Water Shortage Surcharges FY 2029						
Customer Class	**Stage 1**	**Stage 2**	**Stage 3**	**Stage 4**	**Stage 5**	**Stage 6**
Single-Family Residential						
Tier 1	$0.26	$0.50	$0.76	$1.11	$1.60	$2.33
Tier 2	$0.30	$0.58	$0.88	$1.29	$1.86	$2.71
All Other Potable	$0.26	$0.50	$0.76	$1.11	$1.60	$2.33

Water Shortage Surcharges FY 2030						
Customer Class	**Stage 1**	**Stage 2**	**Stage 3**	**Stage 4**	**Stage 5**	**Stage 6**
Single-Family Residential						
Tier 1	$0.30	$0.58	$0.90	$1.32	$1.92	$2.81
Tier 2	$0.35	$0.67	$1.04	$1.53	$2.23	$3.26
All Other Potable	$0.30	$0.58	$0.90	$1.32	$1.92	$2.81

EXHIBIT "B" TO RESOLUTION NO. 11-2025

AMENDED AND RESTATED RESERVE FUNDS POLICY

1. There is hereby established in the Districts books, two reserve funds, which are designated the Operations Fund and the Capital Facilities Fund. All unrestricted reserve funds currently held by the District shall upon adoption of this policy be designated and accounted for within either the Operations Fund or the Capital Facilities Fund.

2. The Operations Fund is established to meet the day to day operating expenses of the District. The Operations Fund shall consist of an operating reserve and a rate stabilization reserve balance. The reserve shall be initially funded with unrestricted funds currently held in the District's accounts and supplemented or replenished as necessary from operating revenues and non-operating revenues other than acreage supply charges and/or capacity fee charges.

   a. **Operating Reserve:** An Operating Reserve is intended to promote financial viability in the event of any short-term fluctuation in revenues and/or expenditures, such as those caused by weather patterns, the natural inflow and outflow of cash during billing cycles, natural variability in demand-based revenue streams (such as volumetric charges), and changes in age of receivables in periods of economic distress. The minimum requirement for the Operating Reserve shall be equal approximately to 90 days of operating expenses and the reserve target shall be 120 days of operating expenses, and shall be reviewed and adjusted annually to maintain the levels set forth above.

   b. **Rate Stabilization Reserve: A** Rate Stabilization Reserve is established for the purpose of providing funds necessary to respond to reasonably foreseeable but unpredictable contingencies, which would result in a significant extraordinary expense or temporary reduction or disruption in revenues, without requiring an increase in water rates or service charges. Examples of contingencies include natural disasters such as earthquakes and fires, or unanticipated reductions in water sales due to unusually wet weather. The Rate Stabilization Reserve has a target balance of $6.0 Million.

3. The Capital Facilities Fund is established to fund scheduled rehabilitation and replacement of district capital facilities, improvement of capital facilities to meet regulatory requirements and improve service reliability, and for projects to expand the capital facilities to meet future demand. The Capital Facilities Fund shall consist of an Expansion Reserve and a Capital Improvement Reserve. The Expansion Reserve shall be funded exclusively with revenues derived from acreage supply charges and/or capacity fee charges imposed on new or expanded connections, currently held by the District and collected in the future. All acreage supply charge and/or capacity fee charge revenues shall be designated as Expansion Reserves and used exclusively for the purposes permitted under the Expansion Reserve policy. The Capital Improvement Reserve shall be initially funded with unrestricted funds of the District and shall be replenished or supplemented with operating and non-operating revenues, other than acreage supply and/or capacity fee charges. Excess funds not needed in one reserve account may be transferred to another reserve account except that no funds from the Expansion Reserve shall be transferred or used for any purpose other than the purposes specified or to reduce future acreage supply charges.

a. **Expansion Reserve:** The Expansion Reserve is established for the exclusive purpose of funding capital improvements to increase the capacity of existing facilities or construct new facilities to serve new development. In accordance with the requirements of Sections 66013 and 66016 of the California Government Code, all acreage supply charge and/or capacity fee charge revenues shall be deposited into the Expansion Reserve and accounted for separately in a manner that avoids any commingling with other moneys of the District and expended solely for the purposes for which the charges were collected. All interest earned on the investment of the Expansion Reserve shall remain in the Expansion Reserve. Not later than 180 days after the last day of each fiscal year, the District shall make available to the public the following information:

(i) A description of the charges deposited into the Expansion Reserve.
(ii) The beginning and ending balance of the fund and the interest earned from investment of moneys in the fund.
(iii) The amount of charges collected in that fiscal year.
(iv) An identification of:
   A. Each public improvement on which funds from the Expansion Reserve were expended and the amount of the expenditure for each improvement including the percentage of the total cost of the public improvement that was funded with those funds from the Expansion Reserve if more than one source of funding was used.
   B. Each public improvement on which funds from the Expansion Reserve were expended that was completed during the fiscal year.
   C. Each public improvement that is anticipated to be undertaken in the following fiscal year.
(v) A description of each interfund transfer or loan made from the Expansion Reserve, including the public improvement on which the transferred funds will be expended and the date the transfer is expected to be repaid along with the rate of interest to be paid.
(vi) The information required above may be included in the District's annual financial report.
(vii) If the revenues derived from the acreage supply charges and/or capacity fee charges exceed the amount necessary for the purposes permitted under the Expansion Reserve, then the excess revenues will be used to reduce the amount of the acreage supply charge and/or capacity fee charges in the future.

b. **Capital Improvement Reserve**: A Capital Improvement Reserve is established to accumulate a sufficient fund to pay for scheduled facility rehabilitation and replacement, facility upgrades made necessary by increased regulatory standards, or to improve system reliability. The Capital Improvement Reserve shall have a target balance equal to 6 percent of the total depreciated asset value of the water system.

c. **Capital/Emergency Reserve**: A Capital/Emergency Reserve is established to accumulate sufficient funds to provide separate funding for any unforeseen system failures, while not impacting funds within the Capital Improvement Reserve planned for routine and scheduled system improvements. The Capital/Emergency Reserve shall have a minimum requirement of 6% of the total asset value of the

water system, and a target of 12% of the total depreciated asset value of the water system.

4. Unrestricted Fund Balance: All revenues not otherwise restricted will be deposited into the District's unrestricted account to be used for payment of day- to-day expenses of the District including water purchases, payroll, power charges, and other customary and ongoing expenses of the District's operations.

5. Interest earned on investments of funds in each designated reserve will be credited to that reserve fund.

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

FINAL

THREE VALLEYS REGIONAL URBAN WATER MANAGEMENT PLAN

JUNE 2026

2025 Part 4: Urban Water Management Plan Agency Supporting Information

THREE VALLEYS MUNICIPAL WATER DISTRICT

GEI Consultants

WSC

Prepared by GEI Consultants, Inc. and Water Systems Consulting, Inc.

H

2025 RUWMP Part 4
Walnut Valley Water District
Appendix H

H1: UWMP Compliance Checklist

Retail (x = required)	Order	2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
x	1	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Part 2 Chapter 8 Part 1 Chapter 3
x	1	Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Part 2 Chapter 8 Executive Summary
x	2.1	Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Part 2 Chapter 8
x	2.5	Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Part 2 Chapter 8 Section 2.1
x	2.5	Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Part 2 Chapter 8
x	2.5	Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Part 2 Chapter 8
x	2.4	Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Part 2 Chapter 8 Section 9 Part 4 Appendix H-2
x	2.4	Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Part 4 Appendix H-2
x	2.4	Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Part 1 Chapter 5
n/a	2.4	Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	n/a
x	3	Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Part 2 Chapter 8 Section 1.1
x	3.3	Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Part 2 Chapter 8 Section 1.1
x	3.4	Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Part 2 Chapter 8 Section 1.1
x	3.4	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	Part 2 Chapter 8 Section 1.1
x	3.5	Section 3.5	10631(a)	Describe the land uses within the service area… include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Part 2 Chapter 8 Section 1.1
x	4.2	Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Part 2 Chapter 8 Section 2
x	4.3	Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Part 2 Chapter 8 Section 2.1.3
x	4.3	Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Part 2 Chapter 8 Section 2.1.3
x	4.2	Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Part 2 Chapter 8 Section 2.3
x	4.2	Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Part 2 Chapter 8 Section 2.2

x	4.2	Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Part 2 Chapter 8 Section 2.2
x	4.2	Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall… Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	Part 2 Chapter 8 Section 2
x	4.2	Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Part 2 Chapter 8 Section 2.4 Part 1 Chapter 5
n/a	5.1	Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	n/a
x	5.2	Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Part 2 Chapter 8 Section 3
x	6.1	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Part 2 Chapter 8 Section 4 Part 1 Chapter 3
x	6.1	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Part 2 Chapter 8 Section 4 Part 2 Chapter 8 Section 5.3 Part 1 Chapter 5 Section 2
x	6.2	Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Part 2 Chapter 8 Section 4.2
x	6.2	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Part 2 Chapter 8 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Part 2 Chapter 8 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Part 2 Chapter 8 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin…	Water supplies and recycled water	n/a	Part 2 Chapter 8 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins… describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	Part 2 Chapter 8 Section 4.2 Part 1 Chapter 3
x	6.2	Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water… (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Part 2 Chapter 8 Section 4.2

x	6.2	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Part 2 Chapter 8 Section 4.8
x	6.1	Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Part 2 Chapter 8 Section 4.8 Part 1 Chapter 3 Part 1 Chapter 5
x	6.2	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Part 2 Chapter 8 Section 4.6
x	6.2	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Part 2 Chapter 8 Section 4.5
x	6.2	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Part 2 Chapter 8 Section 4.5
x	6.2	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Part 2 Chapter 8 Section 4.5.1
x	6.2	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Part 2 Chapter 8 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Part 2 Chapter 8 Section 4.5 Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Part 1 Chapter 3 Section 5
x	6.2	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Part 1 Chapter Section 5
x	6.2	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	Part 1 Chapter 3 Section 8
x	6.2	Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Part 2 Chapter 1 Section 4.7 Part 1 Chapter 3 Section 9
x	6.3	Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	Part 2 Chapter 8 Section 4.9 Part 4 Appendix H
x	7.1	Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 5 Part 1 Chapter 3
x	7.2	Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Part 2 Chapter 8 Section 5.3 Part 1 Chapter 5 Section 2
x	7.2	Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Part 1 Chapter 3
x	7.3	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 2.4 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5

x	7.3	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Part 2 Chapter 8 Section 6 Part 1 Chapter 5
x	7.3	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Part 2 Chapter 8 Section 5.1 Part 1 Chapter 5
x	8	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8	Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.2	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.2	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.3	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.3	Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	Part 4 Appendix H-7
x	8.4	Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Part 4 Appendix H-7
x	8.4	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Part 4 Appendix H-7
x	8.4	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Part 4 Appendix H-7
x	8.4	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Part 4 Appendix H-7
x	8.4	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Part 4 Appendix H-7
x	8.4	Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Part 4 Appendix H-7
x	8.5	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.5	Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.6	Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.7	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.7	Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3. *Water Shortage Emergencies*.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.7	Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Part 4 Appendix H-7

x	8.8	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.8	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.8	Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, *Excessive Residential Water Use During Drought*.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.9	Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.10	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.11	Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	8.12	Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Part 4 Appendix H-7
x	9.1	Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Part 2 Chapter 8 Section 8
n/a	9.2	Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	n/a
x	10	Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9
x	10.2	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Part 2 Chapter 8 Section 9 Part 4 Appendix H-2
x	10.4	Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 202 6.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9
x	10.2	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix H-3
x	10.2	Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Part 4 Appendix H-3
x	10.3	Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Part 4 Appendix H-3
x	10.4	Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9
x	10.4	Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9
x	10.4	Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9

x	10.7	Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9
x	10.5	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9
x	10.5	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9
x	10.6	Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	Part 2 Chapter 8 Section 9

H2: Public Outreach

H2: Attachment 1 – 60 Day Notices

Document will be provided upon request through our contact us page.

H2: Attachment 2 – Regional Workshop #1 Materials

Document will be provided upon request through our contact us page.

H2: Attachment 3 – Regional Workshop #2 Materials

Document will be provided upon request through our contact us page.

H3: Adoption Resolution

RESOLUTION NO. 05-26-754

A RESOLUTION OF THE BOARD OF DIRECTORS OF WALNUT VALLEY WATER DISTRICT ADOPTING THE 2025 URBAN WATER MANAGEMENT PLAN

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt an Urban Water Management Plan ("UWMP") every five years; and

WHEREAS, the Urban Water Management Planning Act establishes the requirements and procedures for preparation and adoption of an Urban Water Management Plan; and

WHEREAS, Walnut Valley Water District has prepared the 2025 Urban Water Management Plan in compliance with applicable provisions of the California Water Code; and

WHEREAS, the District partnered with Three Valleys Municipal Water District and participating member agencies as part of a regional cost-sharing effort for preparation of the 2025 UWMP; and

WHEREAS, notices regarding the preparation of the 2025 UWMP and the public hearing were provided in accordance with California Water Code requirements, including letters sent to cities within the District's service area on March 19, 2026, and publication of notices in the San Gabriel Valley Tribune on May 4, 2026, and May 11, 2026; and

WHEREAS, a copy of the draft 2025 UWMP was made available for public review on the District's website; and

WHEREAS, the Board of Directors of Walnut Valley Water District has reviewed, discussed, and considered the 2025 Urban Water Management Plan and determined it to be consistent with the requirements of the Urban Water Management Planning Act and an accurate representation of the District's long-term water supply planning efforts.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Walnut Valley Water District as follows:

1. The Board of Directors hereby adopts the 2025 Urban Water Management Plan.

2. The General Manager, or designee, is authorized and directed to submit the adopted 2025 Urban Water Management Plan to the California Department of Water Resources in accordance with applicable law.

PASSED, APPROVED, AND ADOPTED by the Board of Directors of Walnut Valley Water District at a public meeting thereof duly called and held this 18th day of May 2026, by the following roll call vote:

AYES: **Hilden, Kwong, Tang, Woo**
NOES:
ABSENT: **Lee**
ABSTAIN:

Jerry Tang
President, Board of Directors

ATTEST:

Sheryl L. Shaw, P.E.
Secretary, Board of Directors

H4: Ordinances

The following ordinance is available online. Select the link below to view:
Ordinance No. 01-18-22 (Pages 38-44).

H5: DWR Tables

Submittal Table 2-1 Retail: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (AF)
CA1910234	Walnut Valley Water District	27,622	15,671
	Total	**27,622**	**15,671**

Submittal Table 2-2: Plan Identification

Type of Plan	Name of Regional Alliance or RUWMP
Individual UWMP	Three Valleys Regional Urban Water Management Plan

Submittal Table 2-3: Supplier Identification

Type of Supplier	Year Type	Month and date that the year begins (mm/dd)	Units of measure used in UWMP
Supplier is a retail supplier	Fiscal Year	07/01	AF

Submittal Table 2-4 Retail: Water Supplier Information Exchange

The retail Supplier has informed the following wholesale supplier(s) of projected water use.
Wholesale Water Supplier Name
Three Valleys Municipal Water District

Submittal Table 3-1 Retail: Population - Current and Projected

Category	2025	2030	2035	2040	2045	2050*(opt)*
Population Served	95,645	96,894	98,143	98,630	99,117	99,604

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual

Use Type	Additional Description (as needed)	2025 Actual Water Use Potable or Non-Potable	2025 Actual Water Use Volume (AF)
Single Family		Potable	10,278
Multi-Family		Potable	1,676
Commercial		Potable	1,174
Industrial		Potable	163
Institutional		Potable	276
Landscape		Potable	937
Distribution Water System Losses		Potable	1,167
		Subtotal Potable	15,671
		Subtotal Non-Potable	0
		Total	**15,671**

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected

Use Type	Additional Description	Projected Water Use Potable or Non-Potable (Optional)	Projected Water Use 2030 (AF)	Projected Water Use 2035 (AF)	Projected Water Use 2040 (AF)	Projected Water Use 2045 (AF)	Projected Water Use 2050 opt (AF)
Single Family		Potable	8,947	8,109	7,702	7,740	7,778
Multi-Family		Potable	1,421	1,288	1,223	1,229	1,235
Commercial		Potable	1,126	1,149	1,153	1,156	954
Industrial		Potable	191	195	195	196	162
Institutional		Potable	254	259	260	261	215
Landscape		Potable	948	760	551	553	555
Distribution System Water Losses		Potable	1,332	1,357	1,378	1,394	1,696
		Subtotal Potable	14,218	13,115	12,461	12,529	12,596
		Subtotal Non-Potable	0	0	0	0	0
		Total	**14,218**	**13,115**	**12,461**	**12,529**	**12,596**

Submittal Table 4-3 Retail: Inclusion in Water Use Projections

Projection Item	Included in Projections?
Are Future Water Savings Included in Projections?	Yes
Are Lower Income Residential Demands Included In Projections?	Yes

Submittal Table 4-5 Retail: Water Loss Audit Reporting

Public Water System ID #	Reporting Period	Submitted to DWR Water Loss Audit Program
CA1910234	2020	Yes
CA1910234	2021	Yes
CA1910234	2022	Yes
CA1910234	2023	Yes
CA1910234	2024	Yes

Notes: The "Volume of Water Loss" quantities for FY 2019-20 through FY 2023-24 were obtained from the annual AWWA Water Loss Audits.

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard

Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System?	Real Water Loss State Water Board Standard 2028 Real Water Loss Standard per Unit per day	Real Water Loss State Water Board Standard Units for Real Water Loss	Real Water Loss Most Recent AWWA Water Loss Audit Number of Units (Connections or Miles corresponding with units selected)	Real Water Loss Most Recent AWWA Water Loss Audit Volume of Total Real Loss (AF) (from AWWA Water Loss Audit)	Real Water Loss Per Unit per Day	Apparent Water Loss State Water Board Standard 2028 Apparent Water Loss Standard per Unit per Day	Apparent Water Loss State Water Board Standard Units for Apparent Water Loss	Apparent Water Loss Most Recent AWWA Water Loss Audit Number of Connections	Apparent Water Loss Most Recent AWWA Water Loss Audit Volume of Total Apparent Loss (AF) (from AWWA Water Loss Audit)	Apparent Water Loss Per Unit per Day
CA1910234	Yes	26.8	Gallons per Service Connection per Day (GPSCD)	27,765	1117	35.9	4.9	Gallons per Service Connection per Day (GPSCD)	27,765	110	3.5

Water Board's Calculated Water Loss Standards

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress

Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target?	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Actual 2025 GPCD (From SB X7-7 Compliance Form) *	Did Supplier meet the 2020 Target in 2025? *
n/a	n/a	169	149	Yes	146	Yes

Notes: n/a=Not Applicable

***** Only for suppliers that did not meet the Target in 2020

Submittal Table 6-1 Retail: Groundwater Volume Pumped

Groundwater Type	Potable or Non-Potable (OPTIONAL)	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Alluvial Basin	Non-Potable	Puente Basin	1,000	721	426	439	1,556
Alluvial Basin	Non-Potable	Spadra Basin	86	61	36	36	129
		Total	**1,086**	**782**	**462**	**475**	**1,685**

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area

Wastewater Collection Name of Wastewater Collection Agency	Wastewater Collection Wastewater Volume Metered or Estimated? Optional	Wastewater Collection Volume of Wastewater Collected from UWMP Service Area 2025 (AF)	Recipient of Collected Wastewater Name of Wastewater Treatment Plant (WWTP) and Place ID Number	Recipient of Collected Wastewater Is WWTP Located Within UWMP Area?
Sanitation Districts of Los Angeles County	Estimated	5,035	Pomona Water Reclamation Plant, Place ID 250700	No
Total Wastewater Received from UWMP Service Area in 2025:		**5,035**		

Submittal Table 6-3 Retail: Wastewater Treatment and Outcomes Within UWMP Service Area

Wastewater Treatment Plant Name and Place ID Number	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (Optional)	2025 Volume of Wastewater Received from UWMP Service Area (AF)	Total 2025 Volume of Water Treated (AF)	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Within UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Treatment Level	2025 Outcomes of Treated Wastewater Water Recycled Outside of UWMP Service Area Volume (AF)	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Treatment Level	2025 Outcomes of Treated Wastewater Effluent Discharge that is not a Permitted Recycled Water Use Volume (AF)	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Treatment Level	2025 Outcomes of Treated Wastewater Required Discharge for Instream Flow Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Treatment Level	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Volume (AF)	2025 Outcomes of Treated Wastewater Delivered to Another Entity for Additional Treatment Name of other entity
Total		**0**	**0**		**0**		**0**		**0**		**0**		**0**	

Notes: Wastewater was not treated or disposed of within the UWMP service area; therefore, this table was intentionally left blank.

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

Use Type	Potable or Non-Potable (after treatment if treated) (Optional)	Additional Information	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)	Potential Recycled Water Use Volume	Potential Recycled Water Use Narrative page number (Optional)
Landscape irrigation (exc golf courses)		Nurseries, golf courses, roadside irrigation, parks, schools, greenbelts, and maintenance districts	2,362	2,151	2,131	2,098	2,051	1,993		
		Subtotal Potable	0	0	0	0	0	0	0	
		Subtotal Non-Potable	2,362	2,151	2,131	2,098	2,051	1,993	0	
		Total	**2,362**	**2,151**	**2,131**	**2,098**	**2,051**	**1,993**	**0**	**0**

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual

Use Type	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Landscape irrigation (exc golf courses)	3,489	2,362
Total	**3,489**	**2,362**

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (AF)
		Total (AF)	**0**
		Unit Conversion to AF	**0**

Notes: The Supplier plans to expand recycled water use in the future and a narrative explanation is provided in Section 4.5.1 of the UWMP.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other suppliers?	If Yes, Supplier Name	Additional Description	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AF)
Six Basins Groundwater Project	Yes	Rowland Water District	Develop new extraction wells		Ongoing	Average Year	1,500
Covina Irrigating Company Interconnection	Yes	Rowland Water District	Improve system interties		Ongoing	Average Year	2,000
Spadra Basin Optimization Scenario 3	Yes	City of Pomona	Improve system interties		Ongoing	Average Year	3,500

Notes: There are future water supply projects or programs not compatible with this table; therefore, are described in narrative form in Section 4.7 of the UWMP**.**

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Description	2025 Potable or Non-Potable (after treatment if treated) (Optional)	2025 Actual Volume (AF)	2025 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Puente Basin	Non-Potable	1,556	
Groundwater (not desalinated)	Spadra Basin	Non-Potable	129	
Purchased or Imported Water	Metropolitan Water District - Three Valleys Municipal Water District	Potable	15,671	
Recycled Water	Pomona Water Treatment Plan	Non-Potable	677	
		Subtotal Potable	15,671	
		Subtotal Non-Potable	2,362	
		Total	**18,033**	

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Potable or Non-Potable (after treatment if treated) (OPTIONAL)	Projected Water Supply 2030 Reasonably Available Volume (AF)	Projected Water Supply 2030 Total Entitlement (AF) (Optional)	Projected Water Supply 2035 Reasonably Available Volume (AF)	Projected Water Supply 2035 Total Entitlement (AF) (Optional)	Projected Water Supply 2040 Reasonably Available Volume (AF)	Projected Water Supply 2040 Total Entitlement (AF) (Optional)	Projected Water Supply 2045 Reasonably Available Volume (AF)	Projected Water Supply 2045 Total Entitlement (AF) (Optional)	Projected Water Supply 2050 Reasonably Available Volume (AF)	Projected Water Supply 2050 Total Entitlement (AF) (Optional)
Groundwater (not desalinated)	Spadra Basin	Non-Potable	70		69		68		67		64	
Groundwater (not desalinated)	Puente Basin	Non-Potable	833		826		812		792		765	
Purchased or Imported Water	TVMWD/MWD	Potable	13,518		9,915		9,261		9,329		9,396	
Purchased or Imported Water	Main Basin	Potable	0		2,500		2,500		2,500		2,500	
Purchased or Imported Water	Six Basins	Potable	700		700		700		700		700	
Recycled Water	Pomona Water Reclamation Plant	Non-Potable	1,249		1,236		1,217		1,193		1,163	
		Subtotal Potable	14,218		13,115		12,461		12,529		12,596	
		Subtotal Non-Potable	2,151		2,131		2,098		2,051		1,993	
		Total	**16,369**		**15,246**		**14,559**		**14,580**		**14,589**	

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year	Volume Available (AF)	Percent of Average Supply
Average Year	2021-2025	17,843	100%
Single-Dry Year	2021	20,409	114%
Consecutive Dry Years 1st Year	2018	21,043	118%
Consecutive Dry Years 2nd Year	2019	18,173	102%
Consecutive Dry Years 3rd Year	2020	18,603	104%
Consecutive Dry Years 4th Year	2021	20,409	114%
Consecutive Dry Years 5th Year	2022	19,292	108%

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	16,369	15,246	14,559	14,580	14,589
Use totals	16,369	15,246	14,559	14,580	14,589
Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-4 (DWR Submittal Table 6-9R).

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison

Total Type	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
Supply totals	18,723	17,438	16,652	16,676	16,686
Use totals	18,723	17,438	16,652	16,676	16,686
Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-4 (DWR Submittal Table 6-9R).

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison

Year	Total Type / Difference	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (AF)
First year	Supply totals	19,305	17,980	17,169	17,195	17,205
	Use totals	19,305	17,980	17,169	17,195	17,205
	Difference	0	0	0	0	0
Second year	Supply totals	16,672	15,528	14,828	14,849	14,858
	Use totals	16,672	15,528	14,828	14,849	14,858
	Difference	0	0	0	0	0
Third year	Supply totals	17,066	15,896	15,178	15,201	15,210
	Use totals	17,066	15,896	15,178	15,201	15,210
	Difference	0	0	0	0	0
Fourth year	Supply totals	18,723	17,438	16,652	16,676	16,686
	Use totals	18,723	17,438	16,652	16,676	16,686
	Difference	0	0	0	0	0
Fifth year	Supply totals	17,698	16,484	15,741	15,764	15,773
	Use totals	17,698	16,484	15,741	15,764	15,773
	Difference	**0**	**0**	**0**	**0**	**0**

Notes: The supply and demand totals presented in this table reflect an aggregation of both the potable and non-potable water systems. Therefore, the total demand shown here exceeds the potable-only demand projected in UWMP Table 2-6 (DWR Submittal Table 4-2R). The total demand in this reliability assessment includes those potable demands plus the projected non-potable (recycled water) demands, which are scaled to be met 1-to-1 by the recycled water supplies detailed in UWMP Table 4-4 (DWR Submittal Table 6-9R).

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment

Totals	2026	2027	2028	2029	2030
Total Water Use (AF)	19,305	16,672	17,066	18,723	17,698
Total Supplies (AF)	19,305	16,672	17,066	18,723	17,698
Difference w/o WSCP Action (AF)	**0**	**0**	**0**	**0**	**0**

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		

Notes: The Supplier uses the standard six levels of water shortage; therefore, supplier-specific shortage levels and percentage ranges are not separately identified in this table.

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (Percentage)	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)
1	Transfers		Not applicable (see notes)	
2	Transfers		Not applicable (see notes)	
3	Transfers		Not applicable (see notes)	
4	Transfers		Not applicable (see notes)	
5	Transfers		Not applicable (see notes)	
6	Transfers		Not applicable (see notes)	

Notes: The District will consider increased purchased water from the Main Basin, through CDWC, to address increased demands. As noted in Table 2, the District plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands.

Submittal Table 8-3 Retail: Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Landscape - Limit landscape irrigation to specific times	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Limits on watering hours	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	No excessive water flow or runoff	Yes
1	Other - Prohibit use of potable water for washing hard surfaces	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	No washing down of paved surfaces	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Obligation to fix leaks, breaks, or malfunctions	Yes
1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Limits on washing vehicles	Yes
1	Water Features - Restrict water use for decorative water features, such as fountains	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Re-circulating water required for water fountains and decorative water features	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
1	Other	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	No Installation of single pass cooling systems water system in buildings requesting new water service	Yes
1	Other	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Installation of non re-circulating water system is prohibited in new commercial conveyor car wash and new commercial laundry systems	Yes
1	CII - Restaurants may only serve water upon request	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Drinking water served upon request only	Yes
1	CII - Lodging establishment must offer opt out of linen service	Volume	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Option to decline daily linen services at commercial lodging establishments	Yes
2	Other	Volume	Collective reduction from all Shortage Level 2 actions is up to 4,082 AF	Includes all Stage 1 actions	Yes
2	Other water feature or swimming pool restriction	Volume	Collective reduction from all Shortage Level 2 actions is up to 4,082 AF	Re-filling of water constituting more than one foot of depth and initial filling of residential swimming pools or outdoor spas with potable water is prohibited	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? Volume or Percentage	How much is this going to reduce the shortage gap? Shortage Gap Reduction Value (AF)	Additional Explanation or Reference (Optional)	Penalty, Charge, or Other Enforcement?
3	Other	Volume	Collective reduction from all Shortage Level 3 actions up to 6,124 AF	Includes all Stage 2 actions	Yes
3	Other water feature or swimming pool restriction	Volume	Collective reduction from all Shortage Level 3 actions up to 6,124 AF	Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life	Yes
4	Other	Volume	Collective reduction from all Shortage Level 4 actions up to 8,165 AF	Includes all Stage 3 actions	Yes
5	Other	Volume	Collective reduction from all Shortage Level 5 actions up to 10,206 AF	Includes all Stage 4 actions	Yes
6	Other	Volume	Collective reduction from all Shortage Level 6 actions up to >10,206 AF	Includes all Stage 6 actions	Yes

Submittal Table 10-1 Retail: Notification to Cities and Counties

City or County Name	60 Day Notice	Notice of Public Hearing
Diamond Bar	Yes	Yes
Industry	Yes	Yes
Pomona	Yes	Yes
Walnut	Yes	Yes
West Covina	Yes	Yes
Los Angeles County	Yes	Yes

H6: AWWA Water Audits

The following AWWA Water Audit reports are available online. Select the links below to view each report:

- 2020 AWWA Water Audit
- 2021 AWWA Water Audit
- 2022 AWWA Water Audit
- 2023 AWWA Water Audit
- 2024 AWWA Water Audit

If a link is not available, AWWA Water Audit reports for all years can be downloaded from the WUEdata website.

H7: Water Shortage Contingency Plan

H7: Attachment 1 – Water Shortage Contingency Plan Adoption Resolution

RESOLUTION NO. 05-26-755

A RESOLUTION OF THE BOARD OF DIRECTORS OF WALNUT VALLEY WATER DISTRICT ADOPTING THE 2025 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt an Urban Water Management Plan every five years; and

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting a Water Shortage Contingency Plan ("WSCP"); and

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers to conduct an annual water supply and demand assessment and to include within the WSCP the procedures used to conduct such assessments; and

WHEREAS, Walnut Valley Water District has prepared the 2025 Water Shortage Contingency Plan in compliance with applicable provisions of the California Water Code; and

WHEREAS, the District partnered with Three Valleys Municipal Water District and participating member agencies as part of a regional cost-sharing effort for preparation of the 2025 WSCP; and

WHEREAS, notices regarding the preparation of the 2025 WSCP and the public hearing were provided in accordance with California Water Code requirements, including letters sent to cities within the District's service area on March 19, 2026, and publication of notices in the San Gabriel Valley Tribune on May 4, 2026, and May 11, 2026; and

WHEREAS, a copy of the draft 2025 WSCP was made available for public review on the District's website; and

WHEREAS, the Board of Directors of Walnut Valley Water District has reviewed, discussed, and considered the 2025 Water Shortage Contingency Plan and determined it to be consistent with the requirements of the Urban Water Management Planning Act and an accurate representation of the District's planned response actions during water shortage conditions.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Walnut Valley Water District as follows:

1. The Board of Directors hereby adopts the 2025 Water Shortage Contingency Plan.

2. The General Manager, or designee, is authorized and directed to submit the adopted 2025 Water Shortage Contingency Plan to the California Department of Water Resources in accordance with applicable law.

PASSED, APPROVED, AND ADOPTED by the Board of Directors of Walnut Valley Water District at a public meeting thereof duly called and held this 18th day of May 2026, by the following roll call vote:

AYES: **Hilden, Kwong, Tang, Woo**
NOES:
ABSENT: **Lee**
ABSTAIN:

Jerry Tang
President, Board of Directors

ATTEST:

Sheryl L. Shaw, P.E.
Secretary, Board of Directors

H7: Attachment 2 – Water Shortage Contingency Plan

2025 WATER SHORTAGE CONTINGENCY PLAN

WALNUT VALLEY WATER DISTRICT

ACRONYMS AND ABBREVIATIONS

Acronym	Description
AF	Acre-Foot
AFY	Acre-Feet per Year
AMI	Advanced Metering Infrastructure
CDWC	California Domestic Water Company
CII	Commercial, Industrial, and Institutional
CWC	California Water Code
District	Walnut Valley Water District
DWR	California Department of Water Resources
ERP	Emergency Response Plan
FY	Fiscal Year
GSP	Groundwater Sustainability Plan
LACSD	Los Angeles County Sanitation Districts
MWD	Metropolitan Water District of Southern California
RRA	Risk and Resilience Assessment
SWRCB	State Water Resources Control Board
TVMWD	Three Valleys Municipal Water District
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan

WATER SHORTAGE CONTINGENCY PLAN

LAY DESCRIPTION

WATER SHORTAGE CONTINGENCY PLAN

Walnut Valley Water District (District) 2025 Water Shortage Contingency Plan (WSCP) discusses and provides the following:

- The District's Water Shortage Contingency Plan is a detailed approach which presents how the District intends to act, or respond, in the case of an actual water shortage.
- Preparation of the District's "Annual Water Supply and Demand Assessment" (or Annual Assessment) is discussed. Beginning July 1, 2022, the District has submitted the Annual Assessment each year through 2025. The Annual Assessment includes a review of the District's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent the District's water demands prior to any response actions the District may invoke pursuant to the District's Water Shortage Contingency Plan.
- The District will manage water supplies to minimize the adverse impacts of water shortages. The District's plan for water usage during periods of shortage is designed to incorporate six standard and progressive water shortage levels including up to a 10, 20, 30, 40, and 50 percent shortage, and greater than a 50 percent shortage.
- For each declared water supply shortage level, customers are required to reduce their consumption by the percentage specified in the corresponding water supply shortage level.

- For each declared water supply shortage level, the District has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.
- The operational changes the District has considered in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- The District's Emergency Response Plan is summarized. The Emergency Response Plan provides the management, procedures, and designated actions the District and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of the District's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of the District's water service area are provided.
- The effectiveness of the shortage response actions for each of the District's standard water shortage levels is presented. The District has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands.
- The communication protocols implemented by the District when it declares any water shortage level are presented.
- The compliance and enforcement procedures associated with District's standard water shortage levels are presented.
- The legal authorities associated with District's standard water shortage levels are presented.
- The financial consequences associated with District's standard water shortage levels are presented.

- The District will evaluate the need for revising the Water Shortage Contingency Plan in order to resolve any water shortage gaps, as necessary. The steps necessary for the District to adopt and amend its Water Shortage Contingency Plan are presented.

The following WSCP includes references to Chapters and Sections from the District's 2025 Urban Water Management Plan (UWMP):

1. WATER SUPPLY RELIABILITY ANALYSIS

CWC 10632.

(a)(1) The analysis of water supply reliability conducted pursuant to Section 10635.

The District's sources of supply were discussed in Chapter 4 of the 2025 UWMP and consist of groundwater from Main Basin (through California Domestic Water Company (CDWC)), Puente Basin, Spadra Basin, and treated imported water purchased from Three Valleys Municipal Water District (TVMWD). In addition, the District provides recycled water for irrigation instead of potable supplies. Both Main Basin and Puente Basin are adjudicated, and groundwater supplies are managed. A Groundwater Sustainability Plan (GSP) has been developed for Spadra Basin. The reliability of the various sources of supply is discussed in Chapter 5 of the 2025 UWMP. Based on the adjudication provisions in the Main Basin, the District is able to purchase groundwater, provided an applicable assessment is paid to the Main Basin Watermaster to purchase untreated imported water for groundwater replenishment. Imported water supplies (both treated and untreated) may be impacted in the event MWD implements its Water Supply Allocation Plan (WSAP) due to a water supply shortage. Finally, recycled water is locally generated and generally is not impacted by drought conditions.

2. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

CWC 10632.

(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

CWC 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

Beginning July 1, 2022, the District has submitted the Annual Assessment in accordance with DWR's guidance and requirements. The Annual Assessment includes a review of the District's unconstrained water demands (i.e. water demands prior to any projected

response actions the District may trigger under this Water Shortage Contingency Plan) for the current year and the upcoming (potential single dry) year. The District also includes information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the District's Water Shortage Contingency Plan.

For each Annual Assessment, the District prepares a preliminary assessment which evaluates the adequacy of its water supplies for the current and upcoming years. The preliminary assessment includes a review of water supplies for at least a single dry year.

The components of the Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

2.1. DECISION MAKING PROCESS

The District purchases treated imported water from the Metropolitan Water District of Southern California (MWD) through TVMWD as its primary source of water supply and that source is managed on a fiscal year basis. Consequently, during the third quarter of each fiscal year the District will review its water demands from the initial six months. This information will be used to help develop the Annual Assessment. A draft of the Annual Assessment will be circulated internally within the District for peer review and comment. Based on comments received, a redraft will be prepared and provided to District department managers during the spring of each year. The draft is then provided to the General Manager for final review. Subsequently, a final draft of the Annual Assessment will be provided to the District's Board of Directors for review and included in the agenda as part of a Board meeting such that it can be approved, and any recommended specific shortage response actions may be enacted. The final Annual Assessment will be provided to DWR no later than July 1 of each year.

The Annual Assessments are instrumental in providing guidance to the District for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process helps ensure adequate water supplies resources are available to the District.

2.2. DATA AND METHODOLOGIES

The key data inputs and methodologies which will be evaluated by the District during the preparation of the preliminary assessment include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment will be identified. The evaluation criteria will include, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels), current water demands, a review of water system improvement plans which may impact infrastructure availability, and water quality regulations which may impact groundwater availability. The District compares total demand to total supply to identify potential shortages. If shortages are identified, the District will determine the necessary WSCP level and corresponding reduction.
2) Water Supply: A description of each available water supply source is provided. The descriptions include a quantification of each available water supply source and are based on current production capacities, historical production, Urban Water Management Plans, and prior water supply studies (including Water Supply Assessments and/or Master Plans).
3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, are reviewed. The review includes factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban Water Supplier Monthly

Reports, and existing water shortage levels (see Section 3), and existing water conservation ordinances (see Section 8.1.1 of the UWMP).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands during the current year and the upcoming (potential single dry) year are considered and identified for each source of supply. The evaluation includes factors such as estimated water demands, weather, groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.
5) Infrastructure Considerations: The capabilities of the water distribution system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year are considered. Available production capacities (e.g. groundwater well capacities) and distribution system water losses (see Section 2.1.2 of the UWMP) are reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see Section 4.7 of the UWMP), are considered.
6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies will be described.

If shortages are identified, the District will determine the necessary WSCP level and corresponding reduction.

3. SIX STANDARD WATER SHORTAGE LEVELS

CWC 10632.

(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater

levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and indicating a cross-reference relating its existing categories to the six standard water shortage levels.

The District has a legal responsibility to provide water utility services, including water for residential, commercial, industrial, public authority, and for public fire hydrants and private fire services. The District will manage water supplies prudently to minimize the adverse impacts of water shortages. In its 2015 Plan, the District's WSCP was designed to provide a minimum of 50 percent of normal supply during a severe or extended water shortage. Water shortage trigger mechanisms have been established to ensure that this policy is implemented. This includes structured stages of action referred to as water shortage planning levels.

Table 1 provides a description of the six standard levels which may be triggered by a shortage in one or more of the District's water supply sources, depending on the severity of the shortage and its anticipated duration.

Table 1. Water Shortage Contingency Planning Levels

Submittal Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions (*Narrative description*)**
1	Up to 10%	Watering or irrigating of lawn, landscape, or other vegetated area with potable water will be limited to a maximum number of days per week, to be determined by the District's Board of Directors, or as modified by the General Manager, based on the District's then existing water supply conditions. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within five days after written notification by the District unless other arrangements are made by the District.

Submittal Table 8-1: Water Shortage Contingency Plan Levels		
Shortage Level	**Percent Shortage Range**	**Shortage Response Actions (*Narrative description*)**
2	Up to 20%	In addition to Shortage Level 1, re-filling of water constituting more than one foot of depth and initial filling of residential swimming pools or outdoor spas with potable water is prohibited. Watering or irrigation of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of three days per week on a schedule established and posted by the District. All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 72 hours after written notification by the District unless other arrangements are made by the District.
3	Up to 30%	In addition to Shortage Level 2, filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under Ordinance No. 01-18-22. Watering or irrigating of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of two days per week on a schedule established and posted by the District.
4	Up to 40%	In addition to Shortage Level 3, watering or irrigating of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of two days per week on a schedule established and posted by the District.
5	Up to 50%	In addition to Shortage Level 4, watering or irrigating of lawn, landscape, or other vegetated area with potable water is limited to a maximum of one day per week on a schedule established and posted by the District.
6	>50%	In addition to Shortage Level 5; Additional restrictions may be implemented as determined by the District, after notice to customers.

NOTES:

The 2025 Plan requires urban water suppliers to have six standardized water shortage response actions in accordance with the DWR. The District's previous WSCP, originally included in its 2015 Plan as Ordinance No. 07-16-09 described a permanent Initial Stage followed by four water shortage levels that would be mandatory once put into effect. A crosswalk of the existing (prior) and planned stages of action is shown on the figure below. The shortage level changes were made in 2020 and have remained the same for 2025.

In 2022, the District adopted Ordinance No. 01-18-22, amending and restating Ordinance No. 07-16-09. This ordinance establishes permanent water use efficiency requirements intended to influence water use behavior at all times and further establishes six water supply shortage response stages consistent with the State-mandated shortage levels (see Appendix A).

Corresponding Relationships Between Supplier's 2015 Shortage levels and the 2020 WSCP Mandated Shortage Levels

Established Level	Supply Condition/ Shortage
1	10 to 15%
2	15 to 25%
3	25 to 35%
4	35 to 50%

2020 Standard Level	Shortage Level
1	≤10%
2	10 to 20%
3	20 to 30%
4	30 to 40%
5	40 to 50%
6	> 50%

Note: The 2020 shortage levels have remained the same for 2025.

4. SHORTAGE RESPONSE ACTIONS

CWC 10632.

(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

4.1. DEMAND REDUCTION

As a part of the District's ongoing commitment to consistent water use efficiency, the following water use efficiency requirements are effective at all times and are permanent requirements set forth by the District's Rules and Regulations, Section 4.07.01. Violations

of this initial stage will be considered waste and an authorized use of water, which will result in penalties outlined in Section 14 of Ordinance No. 01-18-22.

1) Limit on Water Duration: Watering or irrigating of lawn, landscape, or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than 15 minutes watering per day per station. This does not apply to landscape irrigation systems that exclusively use very low-flow drip irrigation systems when no emitter produces more than two gallons of water per hour, weather-based controllers, or stream rotor sprinklers that meet 70 percent efficiency standard.
2) Limits on Watering Hours: Watering or irrigation of lawn, landscape, or other vegetated area with potable water is prohibited between the hours of 8:00 a.m. and 5:00 p.m. on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for short periods of time for the express purpose of adjusting or repairing an irrigation system.
3) Limits on Watering Following Precipitation/Rainfall: Watering or irrigating of lawn, landscape, or other vegetated area with potable water within 48 hours following measurable precipitation is prohibited.
4) No Excessive Water Flow or Runoff: Watering or irrigation of any lawn, landscape, or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter, or ditch is prohibited.
5) No Washing Down Hard or Paved Surfaces: Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios, or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume, high-pressure water broom.

6) Obligation to Fix Leaks, Breaks, or Malfunctions: Excessive use, loss, or escape of water through breaks, leaks, or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than seven days after receiving written notice from the District is prohibited.
7) Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat, or trailer, whether motorized or not, is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This does not apply to any commercial car washing facility.
8) Re-circulating Water Required for Water Fountains and Decorative Water Features: Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.
9) No Installation of Single Pass Cooling Systems Water System: Installation of single pass cooling systems is prohibited in buildings requesting new water service.
10) No Installation of Non-re-circulating in Commercial Car Wash and Laundry Systems: Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.
11) No Irrigating Ornamental Turf on Public Street Medians: Irrigating ornamental turf on Public Street Medians with potable water is prohibited.
12) Negligent Waste of Water: At the discretion of the General Manager, the District reserves the right to determine negligent waste or misuse of water supplies. Such water use constitutes an unauthorized waste of water and is subject to the imposition penalties outlined in Section 14 of Ordinance No. 01-18-22.

Stage 1 Water Supply Shortage Level (Up to 10%)

A Stage 1 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and

appropriately respond to existing water conditions and a reduction of water use of up to 10 percent will be required to lower overall water demand.

In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 1 Water Supply Shortage:

1) Limits on Watering Days: Watering or irrigation of lawn, landscape, or other vegetated area with potable water will be limited to a maximum number of days per week, to be determined by the District's Board of Directors, or as modified by the General Manager, based on the District's then existing water supply conditions. The irrigation day limitation and schedule will be posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. The District reserves the right to amend the watering day limits within each prescribed stage as determined by conservation necessity.
2) Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within five days after written notification by the District unless other arrangements are made by the District.

Stage 2 Water Supply Shortage Level (Up to 20%)

A Stage 2 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 20 percent will be required to lower overall water demand.

In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 2 Water Supply Shortage:

3) Limits on Watering Days: Watering or irrigation of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of three days per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. The District reserves the right to amend the watering day limits within each prescribed stage as determined by conservation necessity.
4) Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 72 hours after written notification by the District unless other arrangements are made by the District.
5) Limits on Filling Residential Swimming Pools and Spas: Re-filling of water constituting more than one foot of depth and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

Stage 3 Water Supply Shortage Level (Up to 30%)

A Stage 3 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 30 percent will be required to lower overall water demand.

In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 3 Water Supply Shortage:

1) Limits on Watering Days: Watering or irrigating of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of two days per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. The District reserves the right to amend the watering day limits within each prescribed stage as determined by conservation necessity.
2) Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 48 hours after written notification by the District unless other arrangements are made by the District.
3) Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under Ordinance No. 01-18-22.

Stage 4 Water Supply Shortage Level (Up to 40%)

A Stage 4 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 40 percent will be required to lower overall water demand.

In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 4 Water Supply Shortage:

1) Limits on Watering Days: Watering or irrigation of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of two days per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigation by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. The District reserves the right to amend the watering day limits within each prescribed stage as determined by conservation necessity.
2) Obligation to Fix Leaks, Breaks, or Malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 48 hours after written notification by the District unless other arrangements are made by the District.
3) Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under Ordinance No. 01-18-22.

Stage 5 Water Supply Shortage Level (Up to 50%)

A Stage 5 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 50 percent will be required to lower overall water demand.

In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 5 Water Supply Shortage:

1) Limits on Watering Days: Watering or irrigation of lawn, landscape, or other vegetated area with potable water is limited to a maximum of one day per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. This restriction does not apply to the following categories of use:
    i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device
    ii. Maintenance of existing landscape necessary for fire protection
    iii. Maintenance of existing landscape for soil erosion control
    iv. Maintenance of plant materials identified to be rare or essential to the well-being of protected species
    v. Maintenance of landscape within active public parks and playing fields, daycare centers, golf course greens, and school grounds, provided that such irrigation does not exceed two days per week according to the schedule established in Section 6(8)(1) and time restrictions in Section 5(8)(1) of Ordinance No. 01-18-22
    vi. Actively irrigated environmental mitigation projects

Stage 6 Water Supply Shortage Level (More than 50%)

Stage 6, also referred to as an “Emergency” condition, exists when the District, through its Board of Directors, declares a water shortage emergency and notifies its residents and

businesses that more than 50 percent reduction of water use is necessary to maintain sufficient water supplies for public health and safety.

In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 6 Water Supply Shortage:

1) Limits on Watering Days: Watering or irrigation of lawn, landscape, or other vegetated area with potable water is limited to a maximum of one day per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. This restriction does not apply to the following categories of use:
    i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device
    ii. Maintenance of existing landscape necessary for fire protection
    iii. Maintenance of existing landscape for soil erosion control
    iv. Maintenance of plant materials identified to be rare or essential to the well-being of protected species
    v. Maintenance of landscape within active public parks and playing fields, daycare centers, golf course greens, and school grounds, provided that such irrigation does not exceed two days per week according to the schedule established in Section 6(8)(1) and time restrictions in Section 5(8)(1) of Ordinance No. 01-18-22
    vi. Actively irrigated environmental mitigation projects

Table 2. Demand Reduction Actions

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Landscape - Limit landscape irrigation to specific times	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Limits on watering hours	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	No excessive water flow or runoff	Yes
1	Other - Prohibit use of potable water for washing hard surfaces	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	No washing down of paved surfaces	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Obligation to fix leaks, breaks, or malfunctions	Yes
1	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Limits on washing vehicles	Yes
1	Water Features - Restrict water use for decorative water features, such as fountains	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Re-circulating water required for water fountains and decorative water features	Yes
1	Other	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	No Installation of single pass cooling systems water system in buildings requesting new water service	Yes
1	Other	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Installation of non re-circulating water system is prohibited in new commercial conveyor car wash and new commercial laundry systems	Yes
1	CII - Restaurants may only serve water upon request	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Drinking water served upon request only	Yes
1	CII - Lodging establishment must offer opt out of linen service	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Option to decline daily linen services at commercial lodging establishments	Yes
2	Other	Collective reduction from all Shortage Level 2 actions is up to 4,082 AF	Includes all Stage 1 actions	Yes
1	Landscape - Limit landscape irrigation to specific times	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	Limits on watering hours	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	No excessive water flow or runoff	Yes
1	Other - Prohibit use of potable water for washing hard surfaces	Collective reduction from all Shortage Level 1 actions is up to 2,041 AF	No washing down of paved surfaces	Yes

Submittal Table 8-3: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
2	Other water feature or swimming pool restriction	Collective reduction from all Shortage Level 2 actions is up to 4,082 AF	Re-filling of water constituting more than one foot of depth and initial filling of residential swimming pools or outdoor spas with potable water is prohibited	Yes
3	Other	Collective reduction from all Shortage Level 3 actions up to 6,124 AF	Includes all Stage 2 actions	Yes
3	Other water feature or swimming pool restriction	Collective reduction from all Shortage Level 3 actions up to 6,124 AF	Filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life	Yes
4	Other	Collective reduction from all Shortage Level 4 actions up to 8,165 AF	Includes all Stage 3 actions	Yes
5	Other	Collective reduction from all Shortage Level 5 actions up to 10,206 AF	Includes all Stage 4 actions	Yes
6	Other	Collective reduction from all Shortage Level 6 actions up to >10,206 AF	includes all Stage 5 actions	Yes

NOTES:

4.2. SUPPLY AUGMENTATION

The District does not plan to add a new source of water supply to address customer demands, but will consider increasing supplies from existing sources. Table 3 reflects this approach and does not identify any new supplies. Instead, the District will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. As discussed in Chapter 4, the District's water supply sources include treated, imported surface water purchased from MWD through TVMWD, recycled water supplies (from recycled water purchased from Los Angeles County Sanitation Districts (LACSD) and from groundwater pumped from the Puente and Spadra Basin), and groundwater pumped from Main Basin (purchased through CDWC). As noted in Section 2, beginning July 1, 2022, the District has prepared and submitted an Annual

Assessment which includes a review of water supplies available to meet water demands for the current and upcoming years. In the event the District is currently in, or considers entering into, one of the standard water shortage levels identified in Section 3, the District will consider the water supply augmentation actions described below.

Groundwater rights from the Main Basin, Puente Basin and Spadra Basin are fixed and production cannot be increased. However, for each water shortage level discussed in Section 3, the District may consider augmenting its existing water supplies through the purchase of additional groundwater which CDWC produces from the Main Basin, which is managed by the Main Basin Watermaster. During the period of management under the Main Basin Judgment, significant drought events have occurred. In each drought cycle the Main Basin has been managed to maintain water levels. Parties to the Main Basin Judgment, including CDWC, are authorized to produce groundwater in excess of their rights and pay assessments for such production to the Main Basin Watermaster. The assessments are used to purchase untreated imported water to replenish the Main Basin. The Main Basin Watermaster purchases untreated imported water to replenish the Main Basin from MWD through TVMWD. Groundwater quality is carefully monitored and managed by the Main Basin Watermaster. Treatment facilities and/or blend plans have been developed by water agencies to meet potable water standards and to prevent the spread of any groundwater contamination. Groundwater quality in the Main Basin is not expected to impact potable supplies or constrain supply reliability. Based on historical and on-going management practices, the District can rely on the Main Basin for adequate supplies in response to each of the standard water shortage levels identified in Section 3.

For each water shortage level discussed in Section 3, the District will consider supplementing its existing water supplies through increased groundwater production instead of the purchase of additional imported water supplies. Due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies, including TVMWD. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based

on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its M&I retail demand. The ratio of MWD water supply drought allocation to local water supply will change based on the WSAP stage. MWD drought allocation can be used to make full service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any full service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

In addition to the WSAP, MWD describes supply augmentation actions in its Regional 2025 UWMP, which is incorporated by reference. MWD's first response to any gap between core supplies (from the State Water Project and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million acre-foot (AF). Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and on-going water supply and storage programs and management practices, the District will use up to the treated imported water supply made available from MWD through TVMWD in association with each of the standard water shortage levels identified in Section 3. Water demands will be addressed through increased use of local groundwater supplies and implementation of demand reduction measures through the various stages of action.

Table 3. Supply Augmentation and Other Actions

Submittal Table 8-2: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
1	Transfers	Not applicable (see Notes)	
2	Transfers	Not applicable (see Notes)	
3	Transfers	Not applicable (see Notes)	
4	Transfers	Not applicable (see Notes)	
5	Transfers	Not applicable (see Notes)	
6	Transfers	Not applicable (see Notes)	

NOTES: The District will consider increased purchased water from the Main Basin, through CDWC, to address increased demands. As noted in Table 2, the District plans to implement demand reduction measures in the event water supplies from existing sources are
not sufficient to meet anticipated demands.

4.3. OPERATIONAL CHANGES

During a water supply shortage situation, the District will manage its water supply resources to provide sufficient water supplies capable of meeting the demands of its customers. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in short-term operational changes which are necessary to allow the District to utilize all available water supply sources in response to water shortage situations.

The operational changes the District will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures
- Optimized production from existing available water supply sources

- Potential use of emergency supply sources, including emergency interconnections
- Potential blending of water supply resources
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses

4.4. ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by the District to reduce customer demands are discussed in Section 4.2. There are no additional mandatory restrictions planned at this time.

4.5. EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in the District's standard water shortage levels (identified in Section 3) and the associated demand reduction measures (described in Section 4.2). In addition to the water supply augmentation actions (Section 4.1) and potential operational changes (Section 4.3) which the District may consider in order to continue providing sufficient water supplies, the District will review and implement any necessary steps included in its "Emergency Response Plan".

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including the District, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated "Emergency Response Plan" (ERP) every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the USEPA, confirming the current RRA and ERP have been reviewed and updated. For the District, the RRA certification was due by March 31, 2025, and the ERP certification was due by September 30, 2025.

The District's RRA, reviewed and updated in 2025, evaluates the vulnerabilities, threats, and consequences from potential hazards to the District's water system. The District prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and
- Operation and maintenance.

The District's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with the District's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

The District's ERP, reviewed and updated in 2025, provides the management, procedures, and designated actions the District and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures and other unforeseen circumstances. The District's ERP (which is incorporated by reference) provides guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies which directly affect the water system and the ability to maintain safe operations (such as chlorine release, earthquake,

or a threat of contamination). The ERP also incorporates the results of District's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity
- Plans and procedures for responding to a natural hazard or malevolent act
- Actions and equipment to lessen the impact of a natural hazard or malevolent act
- Strategies to detect natural hazards or malevolent act

The District will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. The District will also review applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

4.6. SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

CWC 10632.5.

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

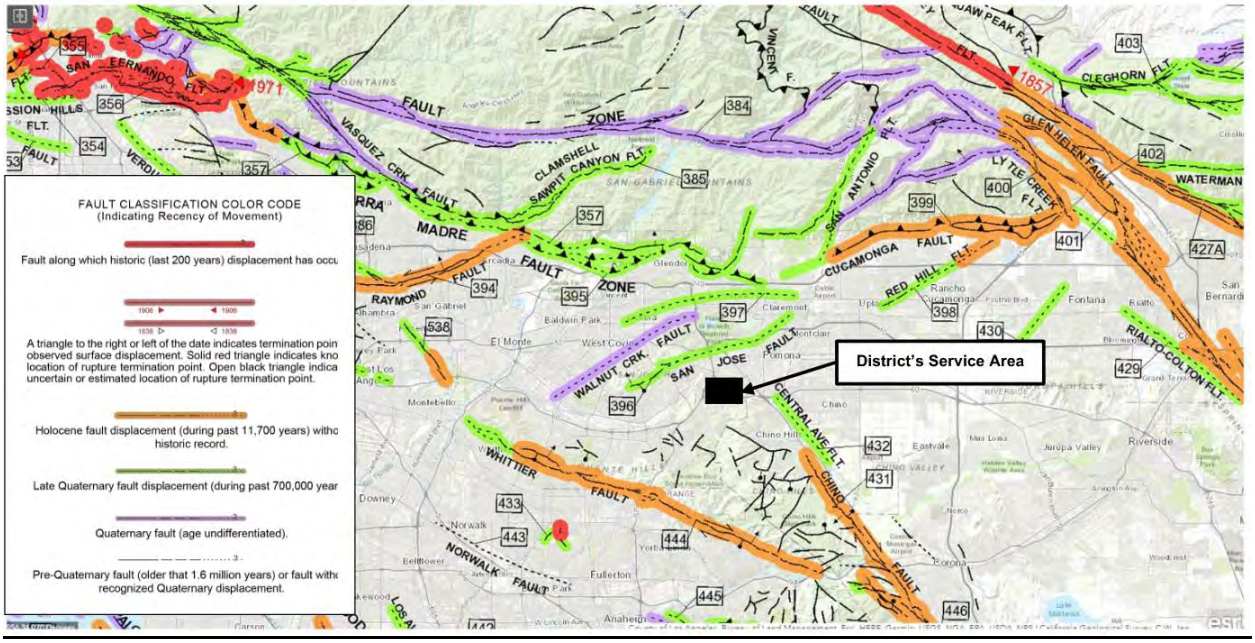
(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

The County of Los Angeles prepared a "All-Hazards Mitigation Plan" in 2019 which identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Los Angeles County, and the mitigation strategies necessary to reduce

risks, including seismic risk. The County's All-Hazards Mitigation Plan is provided in Appendix B.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of the District's water service area are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in the District's water service area include the San Andreas fault, the Walnut Creek fault, the Whittier fault, the San Jose fault, the Chino fault, the Central Avenue fault, and the Sierra Madre fault.

Location of Earthquake Faults

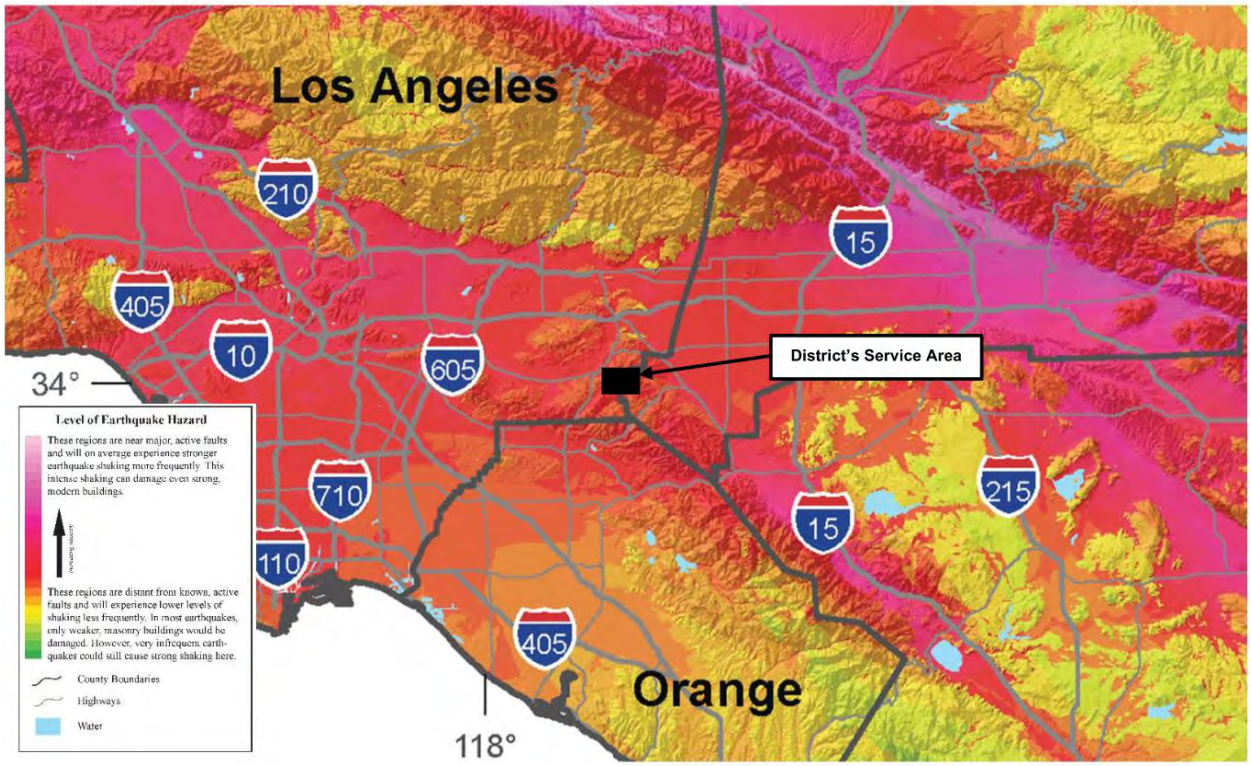


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of the District's service area from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including the District's service area, are

provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 4.5, the District has prepared an Emergency Response Plan which provides the management, procedures, and designated actions the District and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers receive a reliable and adequate supply of potable water. The District's ERP is incorporated by reference.

Earthquake Shaking Potential



Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

4.7. SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 3, is evident in the District's historical ability to meet

its customer's water demands in response to a water supply shortage. In addition, the District imposes water consumption regulations and restrictions and supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of the District's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 2 and Table 3.

During the past five years, the District experienced a consecutive two-year drought within its service area from FY 2021 to FY 2022. Throughout this extended dry year period, the District's annual water production averaged 19,850 acre-feet per year (AFY). During the past five years, the average annual production was approximately 17,843 AFY, with a maximum of 20,409 AF during FY 2021. The District has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, the District has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

The District's water demands during the most recent five years averaged approximately 14,701 AFY of potable water. Due to conservation efforts and demand management measures (discussed in Chapter 8 of the UWMP), the District's recent water demands have been significantly less than its historical water demands, including during long-term droughts. The District's projected water demands (during normal, single dry, and multiple dry years) are provided in Section 5.3 of the UWMP and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. It is anticipated the District will be able to continue providing sufficient water supplies to its customers to meet projected water demands, including during long-term droughts. In addition, as discussed in Section 4.1, based on historical and on-going management practices, the District can rely on its water supply source from the Main Basin for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 3.

In 2022, the District adopted Ordinance No. 01-18-22, amending and restating Ordinance No. 07-16-09, to establish water use efficiency requirements and water supply shortage stages. Following, the District declared a Stage 2 Water Supply Shortage, as identified in Section 7 of the Ordinance. A copy of Ordinance No. 01-18-22 is provided in Appendix A.

Based on the District's demonstrated ability to meet water demands during past water supply shortages, the adopted water shortage levels, the adjusted operating safe yields, and water supplies during long-term droughts, it is anticipated that the District will be able to provide sufficient water supplies to its customers during each of its standard water shortage stages. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. The District will enact varying stages of its WSCP to encourage retail customers to reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of the District's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction section provided in Table 2 and Table 3. The effectiveness of the District's shortage response actions is based on the District's water demands prior to 2015 (unconstrained demands). The District reduced its water demands in 2015 in response to the Governor's April 1, 2015, Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. The District's actual water demand reduction during this period was used to estimate the extent of water use reductions for the District's Water Shortage Stages. The District's Water Shortage Stages 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

5. COMMUNICATION PROTOCOLS

CWC 10632.

(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

The District utilizes established communication protocols and procedures to inform customers, the general public, interested parties, and local agencies of current or anticipated water shortages, shortage response actions, and other relevant information. Water shortage conditions and anticipated supply constraints are evaluated annually through the District's water supply and demand assessment process pursuant to Section 10632.1. If a current or predicted water shortage is identified, the District communicates the assessment findings, anticipated water shortage levels, and applicable response actions through multiple outreach methods to ensure timely and effective notification.

Under Section 12 of Ordinance No. 01-18-22: The existence of Water Supply Shortage Stage conditions may be declared by resolution and adopted at a regular or special Board meeting held by the District in accordance with State law. The mandatory conservation requirements applicable to each Water Shortage Stage condition will take effect on the tenth day after the Stage level is declared. Within five days of following the declaration of the shortage level, the District will publish a copy of the resolution in a newspaper used for publication of official notices.

In addition to public notice requirements, the District informs customers and interested parties through supplemental communication methods, which may include direct customer notifications, postings on the District's website, informational mailings or bill inserts, and press releases.

6. COMPLIANCE AND ENFORCEMENT

CWC 10632.

(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

Violations of Ordinance No. 01-18-22 may be considered an unauthorized use of water and subject to penalties established in the District's Rules and Regulations, Article 4.05.02.03 and/or Article 4.03.07.06. Each day that a violation of this ordinance occurs is considered a separate offense by the District.

Penalties for failure to comply with any provisions of Ordinance No. 01-18-22 are as follows:

1) First Violation: The District will issue a written notice of non-compliance and deliver a copy of this ordinance by certified mail.
2) Second Violation: For a second violation within the preceding 12 months, the District will issue a final written notice of non-compliance.
3) Third and Subsequent Violations: A third violation, and any subsequent violation, within the preceding 12 calendar months may be considered an unauthorized use of water and subject to penalties established in Article 4.05.02.03 and/or Article 4.03.07.06 of the District's Rules and Regulations.

4) Water Flow Restrictor: In addition to any fines, the District may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inches in size and comparatively sized restrictors for larger services after providing written notice to the customer of intent to install a flow restrictor for a minimum of 48 hours prior to such installation.

A person or entity that violates this ordinance is responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the District's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device and disconnection service must be paid to the District before water supply is returned. Nonpayment will be subject to the same remedies as nonpayment of basic water rate established in the District's Rules and Regulations.

The District will issue a Notice of Violation by certified mail or personal delivery at least 10 days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal with the District no later than the close of business on the day before the date scheduled for enforcement action. Any Notice of Violation not timely appealed will be final. Upon receipt of a timely appeal, a hearing on the appeal will be scheduled, and the District will send by certified mail a written notice of the hearing date to the customer at least 10 days before the date of the hearing. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the District may take appropriate steps to prevent the unauthorized use of water appropriate to the nature and extent of the violations and the current declared water level condition.

7. LEGAL AUTHORITIES

CWC 10632.

(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

CWC Division 1, Section 350

The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

Under Section 4 of Ordinance No. 01-18-22, the District's General Manager or his or her designated representative is hereby authorized and directed to implement the staged water conservation and enforcement provisions of the Ordinance, as necessary. In that regard, the General Manager or his or her designated representative shall have the authority to select from among the mandatory water use restrictions, including daily irrigation limitations, specified for each stage of water supply shortage based on the District's then existing water supply conditions.

The District shall declare a water shortage emergency in accordance with CA Water Code CHAPTER 3 - Water Shortage Emergencies § 350 – 358. Legal authorities include California Water Code Sections 71640-71644 Article 3. Water Shortages and CA Water Code § 366 (2025) CHAPTER 3.3 - Excessive Residential Water Use During Drought.

The District's General Manager, or designee, may declare a water shortage emergency and may immediately enact the mandatory requirements of any of the water supply shortage stages designated herein. The required measures of the designated water supply shortage stage will be effective immediately and will be communicated to the public. The emergency implementation will be ratified by resolution of the District's Board of Directors at its next meeting.

The District shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency. This includes the Cities of Diamond Bar, Industry, Pomona, Walnut, and West Covina, as well as the County of Los Angeles.

8. FINANCIAL CONSEQUENCES OF WSCP

CWC 10632.

(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

To ensure compliance with CWC Chapter 3.3 (commencing with Section 365), additional costs may be incurred to monitor and enforce WSCP actions. These costs may vary depending on the applicable water shortage stage and the duration of the water shortage emergency.

Potential revenue reductions and expense increases associated with activated shortage response actions are regulated and tracked by the District's Finance Manager. During periods of water supply shortages, state-mandated water use restrictions, or emergency conditions, the District may require its customers to reduce demands below levels projected under the current water rate structure. Under any of these circumstances, the District may experience a decrease in revenues that may result in insufficient funds to meet projected expenses.

In order to offset any decline in revenues, the District's Board of Directors may adopt resolutions to make additional adjustments to the water rates based on the District's increased costs to provide water to its customers.

9. MONITORING AND REPORTING

CWC 10632.

(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

During times of drought, the District closely monitors customer consumption to ensure its efforts are effective in reducing system-wide demand. Data collected assists the District in making critical decisions and prioritizing drought response actions. The District employs various tools to monitor, evaluate, and report on its conservative objectives. In addition, the District submits the monthly Urban Water Supplier Monitoring Report to SWRCB.

Monthly Reporting

The District evaluates both billed consumption and monthly production data relative to established goals. Using this data allows District staff to gauge effectiveness in managing

overall demand and customers' responsiveness to requests to conserve. The results are compiled and presented to the Board on a monthly basis.

Customer Metering

Customer accounts are metered and billed monthly. Using these records, the District tracks and evaluates consumption data by customer category, meter size, tier-width, and neighborhood, to determine whether customer groups are reaching conservation targets. If drought surcharges are implemented, billing data is evaluated to determine how the surcharges affect customer demand.

Advanced Metering Technology (AMI)

The District has installed approximately 13,000 smart meters, with the remaining meters now converted to AMI. From the utility side, smart meters provide multiple benefits including leak detection, demand forecasting, performance indicators, and improved reporting. By leveraging this data, the District can identify, monitor, and target programs to specific users. This will allow the District to focus conservation messaging and programs on specific customers, or groups of customers. From the customers' side, smart meters can provide information of when and where water is used, establish water budget and water usage alerts, comparisons of water use against other customers, forecasting, and quick leak detection.

Water Conservation and Data Management Services

The District has recently entered into a contract for the use of water conservation and data management software known as Eagle Aerial. Eagle Aerial allows the District to analyze total water allocation at the parcel level, spot water use trends and identify large water users. This information will be critical in calculating indoor and outdoor water use for purposes of complying with the recently enacted water conservation legislation (AB 1668 and SB 606).

Water Use Efficiency Strategic Plan

The District recently completed its Water Use Efficiency Strategic Plan. The Water Use Efficiency Strategic Plan will enable the District to project long-range demands, identify attainable conservation goals, develop strategies, and raise awareness. This plan includes a cost-effective suite of water conservation measures that will help meet future water needs locally and regionally. In addition, by adhering to the Water Use Efficiency Strategic Plan, the District can meet the State of California's current and future requirements and objectives.

10. WSCP REFINEMENT PROCEDURES

CWC 10632.

(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

The District's WSCP has been prepared as an adaptive management plan. As discussed in Section 9, the District will monitor and report in the implementation of the WSCP. The District will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. The District will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 8 of the UWMP)
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 4.1)
- Implementation of stricter enforcement actions and penalties (discussed in Section 6)

- Improvements to the water supply augmentation responses (discussed in Section 4.2), as well as any associated operational changes (discussed in Section 4.3) which may be required
- Incorporation of additional actions recommended by the District staff or other interested parties

The District will use the monitoring and reporting data to evaluate the ability for these potential revisions to resolve any shortage gaps which may occur within the standard water shortage levels.

The WSCP is adopted as part of the District's 2025 UWMP adoption process discussed in Section 9.2 of the UWMP . It is anticipated the District will review, revise, and adopt an updated WSCP as part of preparing its 2030 UWMP, as necessary. However, the District will continue to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to the District's WSCP will include a public hearing and adoption process by the District's Board of Directors (see Section 12).

11. SPECIAL WATER FEATURE DISTINCTION

CWC 10632.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

The District's WSCP defines "decorative water features" as water features which are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water

features. As a result, the District's WSCP has reviewed the response actions, enforcement actions, and monitoring and reporting programs separately for decorative water features and for pools and spas, as applicable.

Under Ordinance No. 01-18-22, filling or refilling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level (discussed in Section 4.1).

12. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

CWC 10632.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

CWC 10635.

(c) Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.

The District's WSCP is adopted as part of the District's 2025 UWMP adoption process discussed in Chapter 9 of the UWMP. The process for adopting the District's WSCP includes the following:

- The District will conduct a public hearing and make the WSCP available for public inspection.
- The District will provide notification of the time and place of the public hearing to any city or county in which water is provided.

- The District will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- The District's Board of Directors will adopt the 2025 Urban Water Management Plan and the WSCP.
- As part of submitting the 2025 Urban Water Management Plan to DWR, the District will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2026. The District will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, the District will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

- The District will conduct a public hearing and make the amended WSCP available for public inspection.
- The District's Board will adopt the amended WSCP.
- The District will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.
- Within 30 days after submission of the WSCP to DWR, the District will provide the WSCP to any city or county within which the District provides water.

Additional information regarding the adoption, submittal, and availability of the District's WSCP (and 2025 UWMP) is provided in Chapter 9 of the UWMP.

APPENDIX A

ORDINANCES

ORDINANCE NO. 01-18-22

AN ORDINANCE OF WALNUT VALLEY WATER DISTRICT
AMENDING AND RESTATING ORDINANCE NO. 07-16-09
TO ESTABLISH WATER USE EFFICIENCY REQUIREMENTS AND
WATER SUPPLY SHORTAGE STAGES

BE IT ORDAINED BY THE BOARD OF DIRECTORS OF WALNUT VALLEY WATER DISTRICT (DISTRICT) AS FOLLOWS:

Section 1: Finding

A. Careful water management that includes active water conservation measures at all times is essential to ensure a reliable supply of water to meet current and future water supply needs within the District's service area.

B. Article X, Section 2, of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented, and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof.

C. California Water Code Section 375 authorizes water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.

D. Section 4.07 of the District's Rules and Regulations ensures that water resources available to the District are put to a reasonable beneficial use and that the benefits of the District's water supply and service extend to the greatest number of persons.

E. The adoption and enforcement of water use efficiency requirements and water supply shortage stages are necessary to manage the District's potable water supply to avoid or minimize the effects of drought and shortage within the District. Such measures are essential to ensure a reliable and sustainable minimum supply of water for the public health, safety, and welfare.

F. In July 2009 the District's Board of Directors adopted Ordinance No. 07-16-09 to establish water use efficiency requirements and water supply shortage stages. California's recent drought and the resulting actions the District has had to take to comply with applicable regulatory requirements has demonstrated that various revisions to that ordinance are necessary to provide greater flexibility for the District to implement water supply shortage restrictions in relation to current water supply conditions and near-term forecasts. The District's Board of Directors therefore is amending and restating Ordinance No. 07-16-09 through this Ordinance No. 01-18-22 to provide that greater flexibility.

Section 2: Purpose

A. The purpose of this Ordinance is to establish water use efficiency requirements and water supply shortage stages that will reduce water consumption within the District through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the District to avoid and minimize the effect and hardship of water shortage on the District and its customers to the greatest extent possible.

B. This Ordinance establishes permanent water efficiency use requirements intended to alter behavior related to water use efficiency at all times and further establishes six stages of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

Section 3: Application

A. The provisions of this ordinance apply to any person in the use of any potable water provided by the District.

B. The provisions of this ordinance do not apply to uses of water necessary to protect public health and safety by the District or essential government services, such as police, fire, and other similar emergency services.

C. The provisions of this ordinance do not apply to the use of recycled water.

D. The provisions of this ordinance do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops, or other vegetation intended for commercial sale.

Section 4: Authorization

A. The District's General Manager or his or her designated representative is hereby authorized and directed to implement the staged water conservation and enforcement provisions of this Ordinance as necessary. In that regard, the General Manager or his or her designated representative shall have the authority to select from among the mandatory water use restrictions, including daily irrigation limitations, specified for each particular stage of water supply shortage based on the District's then existing water supply conditions.

Section 5: Water Use Efficiency Requirements – Prohibition Against Water Waste/Permanent Water Use Restrictions

A. As part of the District's ongoing commitment to water use efficiency at all times, the following water use efficiency requirements are effective at all times and are permanent requirements set forth in the District's Rules and Regulations, Section 4.07.01. Violations of this section will be considered waste and an unauthorized use of water, which will result in penalties outlined in Section 14.

1. **Limit on Watering Duration:** Watering or irrigating of lawn, landscape, or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than 15 minutes watering per day per station. This does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour and weather-based controllers or stream rotor sprinkles that meet the 70 percent efficiency standard.

2. **Limits on Watering Hours:** Watering or irrigation of lawn, landscape, or other vegetated area with potable water is prohibited between the hours of 8:00 a.m. and 5:00 p.m. on any day, except by use of a hand-held bucket or similar container, a hand-held house equipped with a positive self-closing water shut-off nozzle or device, or for short periods of time for the express purpose of adjusting or repairing an irrigation system.

3. **Limits on Watering Following Precipitation/Rainfall:** Watering or irrigating of lawn, landscape, or other vegetated area with potable water within 48 hours following measurable precipitation is prohibited.

4. **No Excessive Water Flow or Runoff:** Watering or irrigating of any lawn, landscape, or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter, or ditch is prohibited.

5. **No Washing Down Hard or Paved Surfaces:** Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios, or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high-pressure water broom.

6. **Obligation to Fix Leaks, Breaks, or Malfunctions:** Excessive use, loss, or escape of water through breaks, leaks, or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than seven days after receiving written notice from the District is prohibited.

7. **Limits on Washing Vehicles:** Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat, or trailer, whether motorized or not, is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This does not apply to any commercial car washing facility.

8. **Re-circulating Water Required for Water Fountains and Decorative Water Features:** Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.

9. **No Installation of Single Pass Cooling Systems Water System:** Installation of single pass cooling systems is prohibited in buildings requesting new water service.

10. **No Installation of Non-re-circulating in Commercial Car Wash and Laundry Systems:** Installation of non-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems

11. **No Irrigating Ornamental Turf on Public Street Medians:** Irrigating ornamental turf on Public Street Medians with potable water is prohibited.

12. **Negligent Waste of Water:** At the discretion of the General Manager, the District reserves the right to determine negligent waste or misuse of water supplies. Such water use

constitutes an unauthorized waste of water and is subject to the imposition penalties outlined in Section 14.

B Voluntary Conservation: In addition to the prohibited uses of water identified above, District customers are encouraged to voluntarily conserve water at all times. District customers are therefore requested to voluntarily implement the mandatory water use restrictions set forth in Stages 1, 2, 3, 4, 5 and 6, to the extent feasible during times when those mandatory restrictions may not be in effect.

Section 6: Stage 1 Water Supply Shortage - (Up to 10% Reduction of Water Use)

A. A Stage 1 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 10 percent will be required to lower overall water demand.

B. **Additional Water Conservation Measures:** In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 1 Water Supply Shortage:

1. **Limits on Watering Days:** Watering or irrigating of lawn, landscape, or other vegetated area with potable water will be limited a maximum number of days per week, to be determined by the District's Board of Directors, or as modified by the General Manager, based on the District's then existing water supply conditions. The irrigation day limitation and schedule will be as posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. The District reserves the right to amend the watering day limits within each prescribed stage as determined by conservation necessity.

2. **Obligation to Fix Leaks, Breaks, or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within five days after written notification by the District unless other arrangements are made with the District.

Section 7: Stage 2 Water Supply Shortage - (Up to 20% Reduction of Water Use)

A. A Stage 2 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 20 percent will be required to lower overall water demand.

B. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Section 4 and 5, the following additional water conservation requirements apply during a declared Stage 2 Water Supply Shortage:

1. **Limits on Watering Days:** Watering or irrigating of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of three days per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. The District reserves the right to amend the watering day limits within each prescribed stage as determined by conservation necessity.

2. **Obligation to Fix Leaks, Breaks, or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 72hours after written notification by the District unless other arrangements are made with the District.

3. **Limits on Filling Residential Swimming Pools & Spas:** Re-filling of water constituting more than one foot of depth and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

Section 8: Stage 3 Water Supply Shortage - Emergency Condition (Up to 30% Reduction of Water Use)

A. A Stage 3 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists,

and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 30 percent will be required to lower overall water demand.

B. **Additional Conservation Measures:** In addition to the prohibited uses of water identified in Sections 4, 5, and 6, the following water conservation requirements apply during a declared Stage 3 Water Supply Shortage:

1. **Limits on Watering Days:** Watering or irrigating of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of two days per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. The District reserves the right to amend the watering day limits within each prescribed stage as determined by conservation necessity.

2. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 48 hours after written notification by the District unless other arrangements are made with the District

Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under Ordinance No. 01-18-22.

Section 9: Stage 4 Water Supply Shortage - Emergency Conditions (Up to 40% Reduction of Water Use)

A. A Stage 4 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 40 percent will be required to lower overall water demand.

B. In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 4 Water Supply Shortage:

1. Limits on Watering Days:

Watering or irrigating of lawn, landscape, or other vegetated area with potable water will be limited to a maximum of two days per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. The District reserves the right to amend the watering day limits within each prescribed stage as determined by conservation necessity.

2. **Obligation to Fix Leaks, Breaks, or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within 48 hours after written notification by the District unless other arrangements are made by the District.

3. **Limits on Filling Ornamental Lakes or Ponds:** Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under Ordinance No. 07-16-09.

Section 10: Stage 5 Water Supply Shortage Level (Up to 50% Reduction of Water Use)

A. A Stage 5 Water Supply Shortage exists when the District, through its Board of Directors, determines that due to drought, a water supply shortage or a threatened water shortage exists, and customer allocations are necessary to make more efficient use of water and appropriately respond to existing water conditions and a reduction of water use of up to 50 percent will be required to lower overall water demand.

B. In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 5 Water Supply Shortage:

1. **Limits on Watering Days**: Watering or irrigating of lawn, landscape, or other vegetated area with potable water is limited to a maximum of one day per week on a schedule established and posted by the District. This does not apply to landscape irrigation zones that exclusively use

very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. This restriction does not apply to the following categories of use:

i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device
ii. Maintenance of existing landscape necessary for fire protection
iii. Maintenance of existing landscape for soil erosion control
iv. Maintenance of plant materials identified to be rare or essential to the well-being of protected species
v. Maintenance of landscape within active public parks and playing fields, daycare centers, golf course greens, and school grounds, provided that such irrigation does not exceed two days per week according to the schedule established in Section 6(8)(1) and time restrictions in Section 5(8)(1) of Ordinance No, 07-16-09
vi. Actively irrigated environmental mitigation projects

Section 11: Stage 6 Water Supply Shortage Level (More than 50% Water Use Reduction)

A. Stage 6, also referred to as an "Emergency" condition, exists when the District, through its Board of Directors, declares a water shortage emergency and notifies its residents and businesses that more than 50 percent reduction of water use is necessary to maintain sufficient water supplies for public health and safety.

B. In addition to the prohibited uses of water identified above, the following water conservation requirements apply during a declared Stage 6 Water Supply Shortage:

1. **Limits on Watering Days**: Watering or irrigating of lawn, landscape, or other vegetated area with potable water is prohibited. This does not apply to landscape irrigation zones that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two gallons of water per hour. This also does not apply to watering or irrigating by use of a hand-held bucket or similar container, or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system. This restriction does not apply to the following categories of use:

i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device
ii. Maintenance of existing landscape necessary for fire protection
iii. Maintenance of existing landscape for soil erosion control
iv. Maintenance of plant materials identified to be rare or essential to the well-being of protected species
v. Maintenance of landscape within active public parks and playing fields, daycare centers, golf course greens, and school grounds, provided that such irrigation does not exceed two days per week according to the schedule established in Section 6(8)(1) and time restrictions in Section 5(8)(1) of Ordinance No. 01-18-22
vi. Actively irrigated environmental mitigation projects

Section 12: Procedures for Determination /Notification of Water Supply Shortage

A. **Declaration and Notification of Water Supply Shortage:** The existence of Stage 1, Stage 2, Stage 3, Stage 4, Stage 5, or Stage 6 Water Supply Shortage conditions may be declared by resolution and adopted at a regular or special Board meeting held by the District in accordance with State law. The mandatory conservation requirements applicable to Stage 1, Stage 2, Stage 3, Stage 4, Stage 5, or Stage 6 conditions will take effect on the tenth day after the date the Stage level is declared. Within five days following the declaration of the shortage level, the District must publish a copy of the resolution in a newspaper used for publication of official notices.

Section 13: Hardship Waiver

A. **Undue and Disproportionate Hardship:** If, due to unique circumstances, a specific requirement of this Ordinance would result in undue hardship to a District customer, the customer may apply for a waiver to the requirements as provided in this section.

B. **Written Finding:** The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a customer.

C. **Application:** Application for a waiver must be on a form prescribed by the District.

D. **Supporting Documentation:** The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

E. **Required Findings for Waiver:** An application for a waiver will be denied unless the District's Board of Directors finds, based on the information provided in the application, supporting documents, or such additional information as may be requested, that because of special circumstances applicable to the property or its use, the strict application of this chapter would have a disproportionate impact on the property or use that exceeds the impacts to residents or businesses.

F. **Approval Authority:** The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition.

Section 14: Penalties and Violations

A. **Violations:** Violations of this ordinance may be considered an unauthorized use of water and subject to penalties established in the District's Rules and Regulations, Article 4.05.02.03 and/ or Article 4.03.07.06.

B. **Penalties:** Penalties for failure to comply with any provisions of the ordinance are as follows:

1. **First Violation:** The District will issue a written notice of non-compliance and deliver a copy of this ordinance by certified mail.

2. **Second Violation:** For a second violation within the preceding 12 calendar months, the District will issue a final written notice of non-compliance.

3. **Third and Subsequent Violations:** A third violation, and any subsequent violation, within the preceding 12 calendar months may be considered an unauthorized use of water and subject to penalties established in Article 4.05.02.03 and/or Article 4.03.07.06 of the District's Rules and Regulations

4. **Water Flow Restrictor:** In addition to any fines, the District may install a water flow restrictor device of approximately one gallon per minute capacity for services up to one and one-half inches in size and comparatively sized restrictors for larger services after providing written notice to the customer of intent to install a flow restrictor for a minimum of 48 hours prior to such installation.

C. **Cost of Flow Restrictor and Disconnecting Service:** A person or entity that violates this ordinance is responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the District's schedule of charges then in effect. The charge for installing and/or removing any flow restricting device and disconnection service must be paid to the District before water supply is returned. Nonpayment will be subject to the same remedies as nonpayment of basic water rate established in the District's Rules and Regulations.

D. **Separate Offenses:** Each day that a violation of this ordinance occurs is a separate offense.

E. **Notice and Hearing:** The District will issue a Notice of Violation by certified mail or personal delivery at least 10 days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal with the District no later than the close of business on the day before the date scheduled for enforcement action. Any Notice of Violation not timely appealed will be final. Upon receipt of a timely appeal, a hearing on the appeal will be scheduled, and the District will send by certified mail a written notice of the hearing date to the customer at least 10 days before the date of the hearing. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the District may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water Level condition.

F. **Reporting Mechanism - Hotline:** The District has established a water waste hotline (909) 348-8228 and an online report form on the District's website (www.wvwd.com) for customers to report water waste violations detailed in this Ordinance.

Section 15: Severability: If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be unconstitutional or invalid by a court of competent jurisdiction, such decision shall not affect the remaining portions of this Ordinance and those shall remain in full force and effect.

Section 16: Effective Date:

A. This Ordinance shall become effective as of the date of adoption and the entire Ordinance shall be published once in a newspaper of general circulation in Walnut Valley Water District within 10 days of passage, pursuant to Water Code Section 376 and Government Code Section 606.1.

Ayes:

Noes:
Abstain:
Absent:

Jerry Tang
President, Board of Directors

ATTEST:

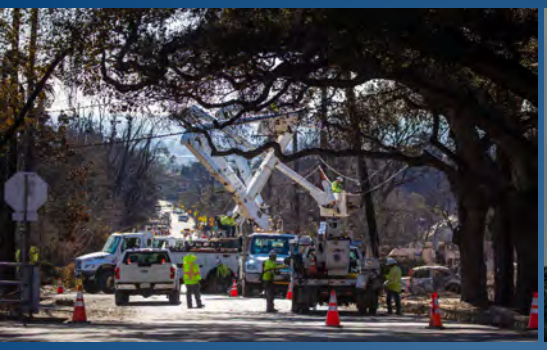
Erik Hitchman
Secretary, Board of Directors

APPENDIX B

LOS ANGELES COUNTY'S ALL-HAZARDS MITIGATION PLAN

2025 County of Los Angeles All-Hazards Mitigation Plan

Chief Executive Office - Office of Emergency Management









Acknowledgement

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County Departments

Aging and Disabilities
Chief Executive Office
Chief Sustainability Office
Beaches and Harbors
Economic Opportunity
Health Services
Human Resources
Parks and Recreation
Public Health
Public Social Services
Public Works
Regional Planning
Fire (LACoFD)
Internal Services
Sheriff (LASD)

Disaster Management Area Coordinators

State of California

California Governor's Office of Emergency Services (Cal OES)
California State Council on Developmental Disabilities (SCCD)

External Partners

Access Services
Alzheimer's Association
Catholic Charities
City of Beverly Hills
City of Long Beach
Disability Community Resource Center
Eastern Los Angeles Regional Center
Emergency Network Los Angeles
Habitat for Humanity
Harbor Regional Center
Lanterman Regional Center
Los Angeles County Office of Education
Los Angeles County Sanitation Districts
Los Angeles County Metropolitan Transportation Authority
Los Angeles Regional Food Bank
Neighborhood Legal Services of Los Angeles County
Puente Hills Habitat Preservation Authority
South Central Los Angeles Regional Center
Westside Regional Center

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Letter of Promulgation

To: Residents, Officials, and Employees of Los Angeles County

Preservation of life and property is an inherent responsibility of local, state, and federal government. The County of Los Angeles produced this updated 2025 All-Hazard Mitigation Plan (AHMP) to delineate mitigation responsibilities of County departments and describe mitigation support to communities.

While no plan can guarantee prevention of death and destruction, a well-developed AHMP can guide mitigation efforts aimed at decreasing the amount of loss experienced after an emergency. The Federal Disaster Mitigation Act of 2000 (DMA 2000) requires that local jurisdictions have an updated mitigation plan in order to be eligible for mitigation project activities. The intent of the 2025 AHMP also ensures that mitigation actions are based on sound planning processes that account for the risks and capabilities of communities within Los Angeles County of Mitigation plans are strategic and policy level documents, forming the foundation of a community's long-term strategy to reduce disaster losses.

The AHMP should be reviewed on an annual basis and approved every five years. The AHMP conforms to the requirements set forth the by the Federal Emergency Management Agency (FEMA) and the California Governor's Office of Emergency Services (Cal OES). The Los Angeles County Board of Supervisors gives its full support to the 2025 All-Hazards Mitigation Plan and urges all residents, officials, and employees to collectively share in our commitment to hazard mitigation.

This letter promulgates the 2025 All-Hazards Mitigation Plan which becomes effective upon approval by the Los Angeles County Board of Supervisors.

Kathryn Barger

Kathryn Barger, Chair
Los Angeles County Board of Supervisors

9/9/25
Date

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1 Introduction, Purpose, and Scope

1.1 Purpose

The 2025 All-Hazard Mitigation Plan (AHMP) was developed in collaboration with a wide range of stakeholders representing County Departments and other external stakeholders from cities, local utilities, non-governmental organizations, and state agencies. The purpose of this AHMP is to form the strategic-level foundation for hazard mitigation efforts undertaken by the County of Los Angeles. The 2025 AHMP is an update to the 2020 version of the plan and seeks to maintain the County's continuing commitment to hazard mitigation as a critical step in reducing hazard risks, making communities safer, and building countywide resilience.

1.2 Scope

Hazard mitigation is defined in the Code of Federal Regulations (CFR) as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." This AHMP identifies and profiles hazards, analyzes the people and critical infrastructure at risk, and provides a series of mitigation strategies aimed at reducing hazard risk. The plan also describes actions to integrate vulnerable communities including people with Access and Functional Needs (AFN) into hazard mitigation planning and other efforts. The AHMP is intended to function as a strategic plan for hazard mitigation and, while not an emergency plan, complements the Los Angeles County Operational Area Emergency Operations Plan. This plan contains mitigation strategies for County-owned facilities or other areas under the jurisdiction of the County of Los Angeles. Hazard mitigation strategies for incorporated cities within Los Angeles County may be found in that city's hazard mitigation plan.

1.3 Legal Authority and Requirements

Historically local hazard mitigation planning has been driven by federal law. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 with new requirements for hazard mitigation. The DMA of 2000 emphasized the need for state, tribal, and local entities to closely coordinate on hazard mitigation efforts and formed the legal basis for the Federal Emergency Management Agency's (FEMA) current mitigation plan requirements in order to utilize Hazard Mitigation Assistance grant programs. This plan was prepared

pursuant to the requirements set forth in the DMA of 2000 and other FEMA hazard mitigation policy guidance.

1.4 Plan Organization

The AHMP is organized into nine (9) sections, excluding the Appendices, including:

1. **Introduction:** Discusses the purpose, scope, and legal authority of the plan.
2. **Planning Process:** Describes the planning process that was undertaken by the Hazard Mitigation Planning Committee to create this updated 2025 AHMP.
3. **Community Profile:** Overviews the unique geographic, climatic, environmental, and socioeconomic factors that make up Los Angeles County and their implications for hazard mitigation planning.
4. **Climate Change:** Outlines the impacts of climate change in Los Angeles County and potential mitigation and adaptation measures.
5. **Integrating AFN into Hazard Mitigation:** Discusses strategies for integrating people with Access and Functional Needs (AFN) into prevention and hazard mitigation efforts.
6. **Hazard Identification and Risk Assessment:** Identifies and profiles nine (9) natural and four (4) human-caused hazards that may impact Los Angeles County including: wildfire, earthquake, extreme heat, drought, flooding, dam failure, land movement, tsunami, severe wind and tornado, mass violence, cybersecurity incidents, transportation incidents, and public health emergencies.
7. **Mitigation Strategy:** Delineates the overall strategy for the County's hazard mitigation efforts including goals and objectives, existing mitigation capabilities, and an analysis of mitigation actions.
8. **Plan Maintenance:** Outlines how the plan will be maintained annually ahead of the next full plan update in five years.
9. **Plan Adoption:** Discusses updates to the plan and implementation following plan adoption.

Following these sections, there are an additional six (6) appendices with supporting materials such as hazard maps, meeting minutes from planning meetings, and information about the public engagement efforts during the planning process.

2 Planning Process

2.1 Overview of the Planning Process

The 2025 Los Angeles County All-Hazard Mitigation Plan (AHMP) update builds upon the robust all-hazard planning framework established by the 2020 All-Hazards Mitigation Plan, while incorporating new methodologies, stakeholder engagement, and compliance requirements. The planning process for this update emphasized inclusivity, transparency, and the integration of emerging climate adaptation considerations.

This planning process followed a structured, phased approach aligned with FEMA's Local Mitigation Planning Policy Guide (2022), 44 CFR requirements, and guidance from the California Governor's Office of Emergency Services (Cal OES). This approach began with project initiation where the scope, timeline, and stakeholders were defined. Stakeholder and public engagement were prioritized to ensure representation from diverse groups, including historically underrepresented communities and climate-vulnerable populations.

Data collection and analysis leveraged updated hazard, climate, and vulnerability data from local, state, and federal sources, providing a foundation for enhanced risk and vulnerability assessments. Hazard profiles were updated to include climate projections and cascading impact scenarios. Mitigation strategies were revised and prioritized with a renewed focus on climate resilience and nature-based solutions. Strategies were also developed incorporating people with access and functional needs throughout each component of the AHMP. Finally, methods for monitoring and evaluation of mitigation efforts were defined in the plan maintenance and implementation strategy. Table 2-1 provides a timeline of the major plan update tasks and milestones over the planning process.

Table 2-1 AMHP Planning Timeline

Date	Tasks	People Involved
February 2025	Reviewed the 2020 AHMP and identified components that require update.	OEM AHMP Project Team
	Collected and reviewed existing documents, including the Threat and Hazard Identification and Risk Assessment (THIRA) along with resources for people with access and functional needs and people experiencing homelessness.	OEM AHMP Project Team
	Met with state Hazard Mitigation Planning Team.	OEM AHMP Project Team, Cal OES Mitigation Division
	Identified the initial list of stakeholders and ensured organizations that work with and represent people with access and functional needs were engaged in the planning process. External stakeholders include neighboring communities, local and regional agencies, and others.	OEM AHMP Project Team
	Conducted 2025 AHMP Kickoff Meetings with internal stakeholders.	OEM AHMP Project Team, Internal County Stakeholder Group, Cal OES Mitigation Division
	Determined hazards to be profiled including both natural (i.e., wildland fire, earthquake, etc.) and human-caused (i.e., cybersecurity, terrorism, etc.).	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group
	Drafted initial sections of the 2025 AHMP.	OEM AHMP Project Team
	Shared drafts of initial sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division

County of Los Angeles
All-Hazards Mitigation Plan

Date	Tasks	People Involved
March 2025	Developed the Public Outreach Engagement Plan to collect feedback from the public on the public draft of the 2025 AHMP.	OEM AHMP Project Team, Cal OES Mitigation Division
	Drafted subsequent sections of the 2025 AHMP including updating existing mitigation actions and developing new mitigation actions as needed.	OEM AHMP Project Team
	Shared drafts of the subsequent sections with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent draft plan elements.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
April/May 2025	Drafted final sections of the 2025 AHMP and produced a Final Draft AHMP.	OEM AHMP Project Team
	Shared Final Draft of the AHMP with internal and external stakeholders for their review.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Met with internal and external stakeholders to obtain feedback on subsequent Final Draft AHMP.	OEM AHMP Project Team, Internal County Stakeholder Group, External Stakeholder Group, Cal OES Mitigation Division
	Produced Final AHMP.	OEM AHMP Project Team

2.2 Stakeholder Engagement

Inclusive stakeholder involvement was essential to the planning process. The County ensured broad representation and participation, consistent with the "Whole Community Approach" outlined in the 2023 Operational Area Emergency Operations Plan (OAEOP). Key stakeholders that comprised the Hazard Mitigation Advisory Committee included:

- County departments such as, but not limited to, Public Works, Public Health, and Regional Planning.
- Cities within the operational area (OA) and neighboring communities through Disaster Management Area Coordinators (DMACs) and city representation.
- Non-governmental organizations (NGOs), including environmental and disability advocacy groups.
- Special District partners managing critical infrastructure.
- Representatives of academia and school districts.
- Community representatives from Access and Functional Needs (AFN) populations and historically underrepresented populations.

Regular meetings, workshops, and focus groups were held to gather input and refine mitigation strategies. Stakeholders were contacted and invited to participate in the 2025 AHMP planning process through email (please see email template in Appendix B-3). Stakeholder feedback was documented and incorporated into the plan, ensuring diverse perspectives informed the process. Tables 2-2 and 2-3 includes a list of representatives of each agency that contributed to the planning process.

Table 2-2 Hazard Mitigation Advisory Committee – Internal Stakeholder Group

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Office of Emergency Management (OEM AHMP Project Team)	Michael Morin	Emergency Management Coordinator	Functioned as lead planners, led planning meetings, drafted plan, reviewed mitigation actions submitted by departments.
	Matthew Topoozian	Emergency Management Coordinator	

Department/ Agency	Name	Title	Planning Contribution
	Karen Haro	Emergency Management Coordinator	
	Girma Wollela	Emergency Management Coordinator	
Los Angeles County Department of Aging and Disabilities	Mike Tsao	Administrative Deputy	Attended planning meetings, reviewed section drafts, and provided feedback.
	Henry Lopez	Program Manager	
	Carin Anderson	Administrative Services Manager	
	Keilah Kelso	Administrative Services Manager	
Los Angeles County Chief Executive Office – Anti-Racism, Diversity, and Inclusion Initiative	Cesar Sanchez	Senior Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Executive Office – Homeless Initiative	Onnie Williams III	Principal Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Chief Sustainability Office	Matthew Gosner	Climate Resilience Officer	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Beaches and Harbors	Katharine de la Cruz	Administrative Services Manager	Attended planning meetings, reviewed section drafts, and provided feedback.
	Vanessa Huerta	Safety Officer	
Los Angeles County Department of Economic Opportunity	Maritza Dubie	Human Services Administrator	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Health Services	Elaine Forsyth	Senior Nursing Instructor	Attended planning meetings, reviewed section drafts, and provided feedback.
	Isabel Sanchez	Disaster Services Specialist	
Los Angeles County Department of Human Resources	Kevin Halbritter	Deputy Compliance Officer	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Parks and Recreation	Ramon Bernal	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Health	Elizabeth Rubin	Epidemiologist	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Department of Public Social Services	Manuel Gutierrez	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/ Agency	Name	Title	Planning Contribution
Los Angeles County Department of Public Works	Joseph Marble	Disaster Services Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
	Loni Eazell	Disaster Services Specialist	
Los Angeles County Department of Regional Planning	Thuy Hua	Supervising Planner	Attended planning meetings, reviewed section drafts, and provided feedback.
	Edgar De La Torre	Principal Regional Planner	
Los Angeles County Fire Department	Nick Duvally	Deputy Fire Chief	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Internal Services Department	Juan-Raul Cardenas	GIS Analyst	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sheriff's Department	Jordan Kennedy	Sergeant	Attended planning meetings, reviewed section drafts, and provided feedback.

Table 2-3 Hazard Mitigation Advisory Committee – External Stakeholder Group

Department/Agency	Planning Contribution
Access Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Alzheimer's Association California	Attended planning meetings, reviewed section drafts, and provided feedback.
California Governor's Office of Emergency Services	Attended planning meetings, reviewed section drafts, and provided feedback.
Catholic Charities	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
City of Beverly Hills Emergency Management Division	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Long Beach Disaster Preparedness & Emergency Communications	Attended planning meetings, reviewed section drafts, and provided feedback.
City of Los Angeles Emergency Management Department	Attended planning meetings, reviewed section drafts, and provided feedback.
Disability Community Resource Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area A	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area B	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area C	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area D	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area E	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area F	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area G	Attended planning meetings, reviewed section drafts, and provided feedback.
Disaster Management Area Coordinator, Area H	Attended planning meetings, reviewed section drafts, and provided feedback.
Eastern Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Emergency Network Los Angeles	Attended planning meetings, reviewed section drafts, and provided feedback.
Habitat for Humanity	Attended planning meetings, reviewed section drafts, and provided feedback.

Department/Agency	Planning Contribution
Harbor Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Lanterman Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Office of Education	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles County Sanitation Districts	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Metropolitan Transportation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
Los Angeles Regional Food Bank	Attended planning meetings, reviewed section drafts, and provided feedback.
Neighborhood Legal Services of Los Angeles County	Attended planning meetings, reviewed section drafts, and provided feedback.
Puente Hills Habitat Preservation Authority	Attended planning meetings, reviewed section drafts, and provided feedback.
South Central Los Angeles Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.
Westside Regional Center	Attended planning meetings, reviewed section drafts, and provided feedback.

2.3 Public Involvement and Outreach

Public outreach efforts aimed to foster transparency, inclusivity, and fortify public trust. The County engaged the public during the planning process through multiple media formats to share information and collect feedback taking into account language and other access and functional needs. A rolling outreach strategy was used to ensure that as each section was drafted and reviewed by planning stakeholders, it was concurrently made available for public commentary. To accomplish this, each section was posted to the Los Angeles County Hazard Mitigation Program website as it was completed by the planning team. A survey designed to gauge community perceptions of hazard risks and mitigation priorities was used on the website (Appendix D). This approach ensured that the public was a key partner in every step of the planning process and had a voice as

each section was being developed by the planning team. A social media campaign using all LA County OEM social media channels was initiated to direct the public to the survey.

To address equity, targeted outreach efforts focused on engaging historically underrepresented communities and AFN populations, using multilingual and accessible materials and culturally appropriate techniques. Aside from public outreach, stakeholders that work with or represent people with access and functional needs, people experiencing homelessness, and a diverse array of cultural groups were targeted to participate in the Hazard Mitigation Advisory Committee. These measures ensured that the public had meaningful opportunities to participate in shaping the plan.

2.4 Review and Incorporation of Existing Plans and Reports

The planning process included a comprehensive review of existing documents and protocols to ensure consistency and alignment. The 2020 All-Hazards Mitigation Plan served as the foundational document for this update. Additionally, key concepts from the 2023 Operational Area Emergency Operations Plan (OAEOP), such as Emergency Support Functions (ESFs) and disaster management areas, were integrated. The Los Angeles County Climate Vulnerability Assessment provided valuable insights into climate risks and social sensitivity, while local Climate Action Plans ensured alignment with municipal climate adaptation initiatives. Furthermore, the 2021 UASI THIRA (Threat and Hazard Identification and Risk Assessment) provided critical data for identifying evolving threats and capability targets, enhancing the accuracy and relevance of the plan. The demographic data from the 2020 U.S. Census was utilized to ensure an accurate representation of Los Angeles County's population, now estimated at over 10 million residents. The demographic breakdown includes 48% Hispanic or Latino, 26% White, 15% Asian, 8% African American, and 3% other, with over 40% speaking a language other than English at home, emphasizing the need for multilingual and culturally appropriate outreach.

Table 2-4 Existing Plans, Maps, and Reports

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Los Angeles County Operational Area Emergency Operations Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy
Los Angeles County 2035 General Plan (2024)	Safety element mitigation policies used to inform Section 7 – Mitigation Strategy
Los Angeles County Comprehensive Floodplain Management Plan (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Floodplain Management Plan Progress Report from (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2021)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to flood hazards
Los Angeles County 2045 Climate Action Plan (2024)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Fire Department Fire Plan (2023)	Used to inform Section 6: Hazard Identification and Risk Assessment and Section 7: Mitigation Strategy for elements related to wildland fire hazards
Our County: Los Angeles Countywide Sustainability Plan (2019)	Used to inform Section 6: Hazard Identification and Risk Assessment, Section 7: Mitigation Strategy, and Section 4: Climate Change for elements related to hazard risk posed by climate change
Los Angeles County Homeless Initiative Strategy Plan (2022)	Used to inform vulnerable populations information across all sections of the plan.
Disability Among Adults in Los Angeles County (2019)	Used to inform vulnerable populations information across all sections of the plan.
Southern California Earthquake Data Center's Earthquake Catalogs (Current as of 2025)	Historical seismic information used in Section 6: Hazard Identification and Risk Assessment.

Plan, Map, or Report	Information to be Incorporated into the 2025 Updated AHMP
Maritime Tsunami Response Playbooks: Background Information and Guidance for Response and Hazard Mitigation Use (2016)	Historical tsunami information used in Section 6: Hazard Identification and Risk Assessment.
FEMA Flood Insurance Study, Los Angeles County, California (2020)	Historical flood information used in Section 6: Hazard Identification and Risk Assessment.
U.S. Geological Survey (USGS): Rainfall and Landslides in Southern California (2015)	Historical landslide information used in Section 6: Hazard Identification and Risk Assessment.
Burn Scar Information and Maps	Historical fire information used in Section 6: Hazard Identification and Risk Assessment.

3 Community Profile

3.1 Los Angeles County Overview



Los Angeles County is the most populous county in the United States, encompassing a diverse array of communities, landscapes, and infrastructure. According to the most recent census data, Los Angeles County has a population of approximately 10 million residents of which more than 1 million reside in unincorporated areas. The County's demographics, geographic features, and economic activities present both unique opportunities and significant challenges for hazard mitigation planning. This updated community profile integrates insights from the 2023 Operational Area Emergency Operations Plan (OAEOP) and reflects changes in population trends, infrastructure development, and climate risks.

The County Operational Area (OA) consists of all political subdivisions within the geographical boundaries of Los Angeles County. It encompasses five supervisorial districts, eight Disaster Management Areas (DMAs), 88 incorporated cities, 80 school districts, and approximately 142 special districts.

3.2 Geography and Land Use



Spanning over 4,000 square miles, Los Angeles County features diverse terrain, including coastal plains, valleys, mountains, islands, and deserts. The County's varied geography includes multiple microclimates that influence its exposure to natural hazards, such as earthquakes, tsunamis, wildfires, floods, and landslides. Urban areas, particularly the City of Los Angeles and its surrounding metropolitan region, are densely populated and heavily developed. In contrast, rural and unincorporated areas often face unique vulnerabilities due to limited infrastructure and resources. Rural areas include the Angeles and Los Padres National Forests, which have small communities, campgrounds, and day use areas. There are also two islands within the County, Santa Catalina and San Clemente. The County also includes a significant amount of Wildland Urban Interface (WUI) areas where residential and commercial development meets underdeveloped wildland with vegetative fuels. Land use within the County is equally diverse, with a mix of residential, commercial, industrial, agricultural, and open spaces. Recent urban development in densely populated areas has increased impervious surfaces like concrete and asphalt, which retain heat and create urban heat islands (UHI) that are much hotter than nearby rural areas. This phenomenon elevates temperatures, especially in low-income communities lacking green spaces for cooling. Additionally, urbanization affects stormwater management by reducing natural drainage and exacerbating flooding risks in low-lying areas.

These trends underscore the need for sustainable planning strategies, such as promoting green infrastructure, enhancing stormwater systems, and mitigating heat islands through tree planting and reflective materials. The County's diverse land use must be carefully managed to reduce vulnerabilities while supporting economic growth and environmental sustainability.

3.3 Social Vulnerability

Social vulnerability is a crucial component to Los Angeles County's hazard mitigation planning. The County is home to a diverse population with disparities in income, housing stability, and access to resources. The Los Angeles County Anti-Racism, Diversity, and Inclusion (ARDI) Initiative created a comprehensive Equity Explorer, which is a geospatial tool that explores multiple equity data points across Los Angeles County. The ARDI Equity Explorer includes various layers that visualize social equity, economic opportunity, housing and homelessness, health, justice, built environment, and disaster recovery data. The public can access this data at ceo.lacounty.gov/ardi/tools. Maps created using data from the ARDI Equity Explorer are in Appendix A-8.

The US Centers for Disease Control and Prevention (CDC) defines social vulnerability as a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters to human caused threats. The CDC's Social Vulnerability Index (Figure 3.1) is designed to identify and quantify communities experiencing social vulnerability.

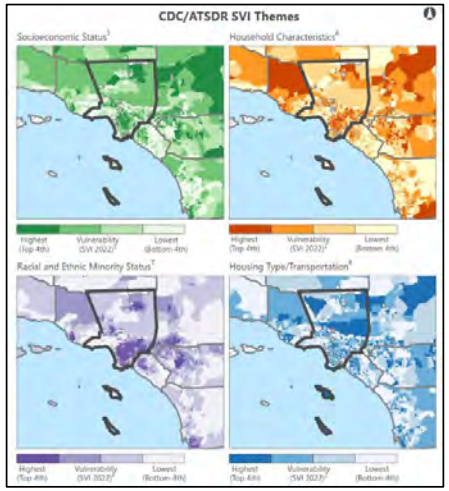


Figure 3.1 CDC Social Vulnerability Index (CDC 2022)

The most recent CDC Social Vulnerability Index score from 2022 for Los Angeles County indicated a high level of vulnerability across four themes: socioeconomic status, household characteristics, racial and ethnic minority status, and housing type/transportation.

Vulnerable populations identified for Los Angeles County that will be considered in the AHMP include:

- **Low-Income Residents**: Individuals living below or near the poverty line are often disproportionately affected by disasters due to limited financial resources for emergency preparedness, response, and recovery.

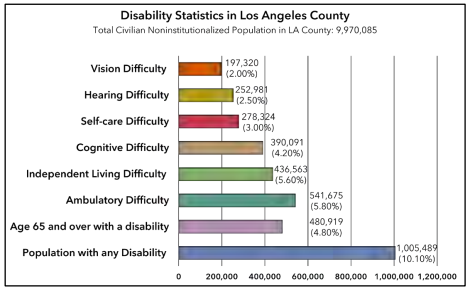


Figure 3.2 Disability Statistics in Los Angeles County (OAEOP 2023)

- **People with Access and Functional Needs (AFN)**: Individuals with Access and Functional needs have increased challenges in preparedness, evacuation, sheltering, accessing emergency services and recovery. Access and Functional Needs include but are not limited to people who have any combination in varying degree of: physical disabilities, intellectual disabilities, developmental disabilities, mental health-related issues, visual impairments, hearing impairments/deaf, mobility impairments, or chronic conditions. AFN also include older adults, infants and children, people living in institutionalized settings, people living below the poverty line or experiencing homelessness, people with limited English proficiency or are non-English speakers, or people who are transportation disadvantaged.

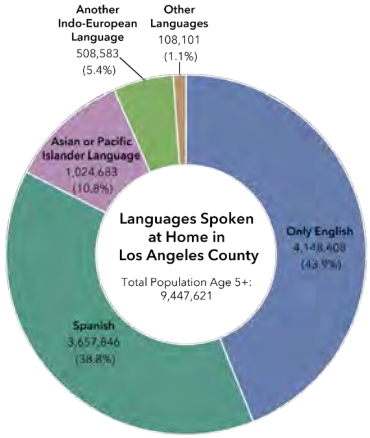


Figure 3. 3 Breakdown of Language at Home in Los Angeles County (OAEOP 2023)

- **People Experiencing Homelessness (PEH)**: With an estimated over 75,000 individuals experiencing homelessness, this population is particularly at risk during extreme weather events and other disasters.
- **Immigration Status**: Fear of engaging with government services based on immigration status can prevent residents from accessing critical resources.

- **Limited English Proficiency:** Over 40% of residents speak a language other than English at home, highlighting the need for multilingual and culturally appropriate outreach efforts. Language accessibility is critical to ensure all residents and visitors can obtain information and services during a disaster. See Figure 3.3 for a breakdown of languages spoken at home in Los Angeles County not including American Sign Language.

The figure below highlights certain variables in Los Angeles County that may increase vulnerability to emergencies and disasters. To address these vulnerabilities, the County's mitigation planning includes equitable strategies designed to reduce risk and enhance resilience among these populations. Targeted outreach, improved access to resources, preparedness education events, and collaboration with community organizations are integral to these efforts.

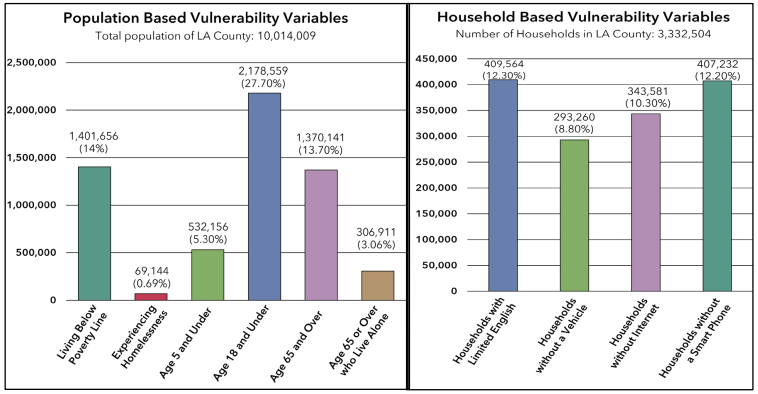


Figure 3.4 Los Angeles County Vulnerability Variables (OAEOP 2023)

The Federal Emergency Management Agency (FEMA) maintains the National Risk Index, a mapping tool that assesses 18 possible hazards a jurisdiction is susceptible to in combination with the amount of loss that could result from those hazards. Los Angeles County ranks as the community with the most risk in the United States according to the FEMA National Risk Index. According to the National Risk Index, hazards with the highest risk for Los Angeles County include earthquake, wildfires, extreme heat, flooding, high winds, and landslides.

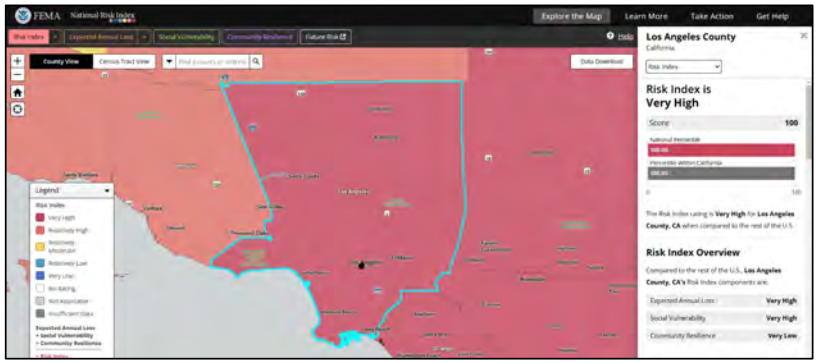


Figure 3.5 FEMA National Risk Index (2025)

3.4 Economy and Critical Infrastructure

Los Angeles County is a global economic hub, hosting industries such as entertainment, technology, manufacturing, and international trade. The Port of Los Angeles and the Port of Long Beach collectively form one of the world's busiest trade gateways, underscoring the importance of protecting critical infrastructure from hazards including those exacerbated by climate change. Critical facilities provide services and functions essential to a community, especially during and after a disaster. Common types of critical facilities include but are not limited to fire stations, police stations, hospitals, schools, and utilities. Critical facilities may also include places that can be used for sheltering, cooling centers, staging purposes, or other large public gathering spots such as community centers and libraries. Critical facilities include those operated by non-governmental and business partners vital for redevelopment or

economic security. When these are affected by a disaster, the County provides businesses and workers impacted by the disaster with vital information and resources. This allows them to maneuver effectively through disaster response toward recovery using its network of job centers and business hubs.

Other critical infrastructure includes the facilities and industries that enable all facets of society to function, including but not limited to the following community lifelines:

- **Safety and Security**: The myriad of local law enforcement, fire and rescue, emergency management, schools, and other government services that maintain public safety and security.
- **Communications:** The interconnected network of infrastructure owners and operators of communications systems such as internet, telephone, cellular and other communications towers, cable, satellite, and more.
- **Transportation Networks**: The County's extensive network of roadways, highways, railways, transit systems, and airports is essential for daily operations and disaster response.
- **Energy Systems**: Power generation facilities, energy distribution networks, and pipelines are vulnerable to multiple types of hazards and threats.
- **Water and Wastewater Systems**: Drought conditions and aging infrastructure at the over 220 different water agencies in Los Angeles County pose risks to water availability and quality.
- **Healthcare Facilities**: Over 100 hospitals and numerous clinics serve the County, requiring robust contingency plans to maintain operations during disasters.
- **Food and Shelter:** The vast system of food production (i.e., agriculture), distribution, and retail along with community housing or sheltering.

3.5 Climate and Environmental Conditions

Los Angeles County faces escalating risks from climate change, significantly impacting its environment, economy, and communities. These challenges include rising temperatures, prolonged droughts, more frequent and severe extreme weather events, and their cascading effects. These risks highlight the critical need for adaptive planning to protect vulnerable populations, infrastructure, and natural resources. Key climate-

related considerations referenced in the Los Angeles County Climate Action Plan that will be addressed in this AHMP include, but are not limited to:

- **Extreme Weather Events:** Extreme temperatures in the Los Angeles region are expected to increase. Both dry and wet extremes are projected to intensify, leading to longer dry periods than historically experienced. These dry periods are expected to be followed by significantly wetter conditions, including atmospheric rivers bringing more intense rainfall. This pattern may result in increased water scarcity, mudslides, and flooding.
- **Sea-Level Rise**: Coastal communities are at heightened risk of flooding and erosion, threatening homes, businesses, and critical infrastructure. Sea level rise can exacerbate the impacts of high tides, storm surges, and heavy precipitation, and can lead to increased coastal flooding and shoreline erosion.
- **Increasing Wildfire Risk**: Climate change has intensified wildfire seasons, particularly in the County's mountainous, wildland urban interface (WUI), and new and undeveloped regions. Wildfires are projected to increase in frequency and intensity including in some areas not historically impacted by wildfire.

In response, the County has prioritized integrating climate adaptation strategies into its hazard mitigation planning, as outlined in the Climate Vulnerability Assessment and the OAEOP.

3.6 Regional Collaboration and Planning Efforts

Los Angeles County's size and complexity necessitates collaboration with numerous jurisdictions, agencies, and community organizations. The County is designated as the Operational Area Coordinator and functions as an intermediate level in the State of California's Standardized Emergency Management System (SEMS). In accordance with SEMS, the County serves as the communications and coordination link between local governments within Los Angeles County and the state government. Partnerships with academic institutions, non-profits, and private sector stakeholders support data collection, public engagement, and innovative mitigation strategies. Additionally, the County has also adopted Emergency Support Functions (ESFs) as the primary emergency management coordination structure. ESFs group function-specific stakeholders who will coordinate throughout all phases of emergency management,

including function-specific mitigation activities. For more information on regional emergency management collaboration and planning, reference the OAEOP.

3.7 Implications for Hazard Mitigation Planning

Understanding the community is a critical aspect in hazard mitigation planning. This community profile will inform key considerations in subsequent sections of the AHMP including but not limited to the following:

- **Targeted Outreach:** Include vulnerable populations and the business community in the planning process through equitable public outreach.
- **Infrastructure Resilience:** Prioritize the protection of critical infrastructure, including ports and transportation networks, energy systems, and water and wastewater systems, among others.
- **Climate Adaptation:** Develop strategies to mitigate the impacts of climate change, focusing on urban heat islands, sea-level rise, and wildfire risks.
- **Regional Coordination:** Strengthen direct collaboration within the OA between the County, local jurisdictions, special districts, unified school districts, the business community and cross-sector non-governmental partners to enhance awareness, preparedness, and response capabilities.
- **Transparent & Open Communication:** Ensure communications are accessible, and clear to advance public trust and safety. Develop dashboards to demonstrate progress.

4 Climate Change

4.1 Climate Change Overview

Climate change refers to the changing effect of the Earth's climate system over time, including changes in temperature, precipitation, and wind patterns. Climate change had significant impacts on Los Angeles County, affecting various aspects of life, environment, infrastructure, and sustainable development, and presents increasing risks from amplified hazards and changing baselines (e.g., sea level) into the future. The rate of climate change has significantly accelerated over the last three decades and trends continues. This plan addresses the effects of climate change related to disasters within the County and strategies to mitigate risks, focusing on preparedness, resilience and equity.

Climate change contributes to more frequent and intense disasters, such as floods, wildfires, drought and excessive heat. Rising temperatures and changing weather patterns pose health risks, like heat-related illnesses, respiratory issues, and the spread of diseases. Hazard mitigation efforts aim to reduce the impacts and effects of greater hazards due to climate change. The economic impact of climate change has been substantial, affecting industries such as agriculture, tourism, and insurance with increasing risks due to accelerating climate changes.

Greenhouse Gas (GHG) emissions are the main driver of climate change, which causes increased frequency, duration, and severity of extreme weather and climate-related disasters. Climate change exacerbates air pollution, leading to poor air quality and health issues. GHG emissions from residential buildings, commercial and institutional facilities, manufacturing industries and construction, energy industries, oil and natural gas systems. transportation, fossil energy, wildfires and other sources contribute to increased particulate matter and other pollutants in the air.

4.2 Integrating Climate Change into Hazard Profiles

Integrating climate change into hazard profiles involves assessing the current and future impacts of climate change on various hazards and incorporating this information into planning and mitigation strategies. This section highlights how climate change relates to these hazards and how the county is addressing climate change through hazard mitigation efforts which help protect the county's residents and economies from the adverse effects of climate changes and climate-amplified events.

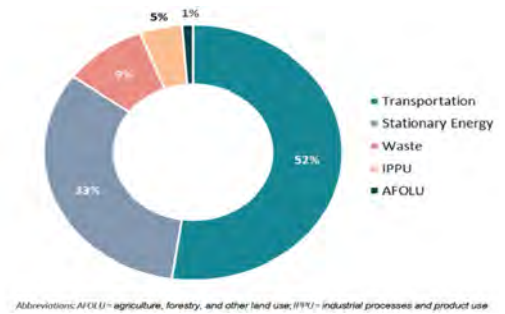


Figure 4.1 Sources of GHG Emissions from within Los Angeles County (LA County 2024; 2045 Climate Action Plan)

4.2.1 Extreme Heat

Increasing temperatures and high heat events is one of the most conspicuous results of and a direct correlation between GHG pollution and climate change. Excessive temperatures in the Los Angeles region are expected to increase significantly more very hot days and warm nights. In addition to increasing baseline temperatures and extreme heat due to climate change, heat islands exacerbate temperatures and high heat events. As development occurs and darker paved surfaces replace open land and vegetation, these areas become warmer forming an "island" of heat. Los Angeles County experiences more frequent and excessive heat due to climate change. This is currently a major risk and with unmitigated GHG emissions increasing heat will lead to even greater health issues, increased energy demand for cooling, and other strains on infrastructure.

4.2.2 Flooding

Flooding in Los Angeles County occurs due to extreme rainfall events causing flash floods, riverine flooding, and increased surface water. Coastal areas in Los Angeles County are vulnerable to sea- level rise (SLR), which exacerbates coastal hazards like floods, storm surges, and chronic erosion. Other related hazards include flooding near

the mouths of streams and channels, landslides, and seawater well intrusion. SLR exacerbates the impacts of high tides, storm surges, and heavy precipitation flooding, and continued SLR will lead to more life safety concerns and increased damage to property and infrastructure.

4.2.3 Drought

Prolonged droughts have become more common, affecting the water supply, agriculture, and ecosystems of Los Angeles County. Dry and wet extremes are projected to increase and are likely to cause drier periods than what the region has historically experienced.

Southern California projected to get drier, while Northern California will increase in temperature. This will result in loss of snowpack within the Sierra Nevada Mountain range, meaning less water for all Californians including farmers, residents, and utilities. The State Water Resource Control Board proclaimed several water conservation emergency regulations due to severe drought conditions that requires commercial, industrial, and residential conservation efforts. Proclamations include:

- **January 4, 2022:** State Water Board adopted the prohibited wasteful water uses emergency regulation
- **May 24, 2022:** the State Water Board adopted the emergency regulation to ban decorative grass watering like non-functional turf irrigation
- **December 7, 2022:** the State Water Board readopted the prohibited wasteful water uses emergency regulation,
- **May 26, 2023:** the State Water Board readopted the emergency regulation to ban decorative grass watering.

4.2.4 Wildfire

A wildfire is an unplanned and uncontrolled fire in an area of combustible vegetation. These fires can easily spread beyond the natural areas primarily involving and have a potential to cause damages outside of the perimeter. Wildfire probability depends on local weather conditions, outdoor activities and any preceding conditions (e.g., lots of rain leading to vegetation growth and then drying conditions), and a potential ignition (e.g., lightning strike, arson, debris burning, electrical equipment failure, car tailpipe, etc.). The frequency and intensity of wildfires has increased driven by higher

temperatures, lower precipitation, lower relative humidity, and prolonged droughts. These events have caused loss of life, destroy and/or damage to property, infrastructure, the environment and pose greater risks due to historical development patterns. The timeline of major wildfire events and acreage burned in Los Angeles County is listed at Section 6.2 of the plan.

4.3 Climate Mitigation Strategies

Los Angeles County is actively addressing climate change and implementing hazard mitigation strategies to reduce its impacts and build long-term resilience. The County faces increasing risks from excessive heat, wildfires, droughts, floods, and sea-level rise, all of which threaten communities, infrastructure, and natural resources.

To address many of these challenges, the County has developed comprehensive climate plans and strategies that integrate climate adaptation, sustainable land use, emergency preparedness, and environmental conservation. By enforcing building codes, investing in green infrastructure, and strengthening community preparedness, Los Angeles County aims to minimize risks and enhance disaster resilience. These efforts align with state and federal climate policies and are designed to protect both current and future generations while encouraging a more sustainable and livable environment for all.

4.3.1 Climate Resilience Plans and Actions

- **Los Angeles County 2045 Climate Action Plan (2045 CAP):** Establishes aggressive targets to reduce greenhouse gas emissions and achieve carbon neutrality by 2045.
- **Water Conservation & Drought Resilience Measures:** Implements mandatory water restrictions, promotes rainwater harvesting, and expands groundwater recharge and water recycling projects.
- **Wildfire Mitigation & Vegetation Management Programs:** Enforces Wildland Urban Interface (WUI) codes, increases forest management techniques, aligned with Traditional Ecological Knowledge (TEK) principles and practices of our native indigenous communities, and strengthens fire-resistant building and landscape requirements.

- **Green Infrastructure & Urban Cooling Initiatives:** Expands tree planting aligned with TEK principles and practices, investigates removing hard (paved) surfaces, and planting groundcover, utilizes and promotes public cooling centers and home heat preparedness, and encourages the use of reflective "cool" roofing and surfaces to mitigate the urban heat island (UHI) effect.
- **Heat Action Plan:** Develops strategies to reduce the adverse health impacts of excessive heat through public shade structures, cooling centers, building codes, and increased public awareness campaigns for all susceptible to extreme heat.

These strategic actions reflect Los Angeles County's commitment to tackling climate change. By integrating proactive policies, indigenous-informed practices, community-driven solutions, and resilient infrastructure, Los Angeles County, is not only mitigating current risks but also preparing for a future where communities can thrive in an ever-changing dynamic environment.

4.4 Climate Change Conclusion

Through proactive policies and community engagement, Los Angeles County strives to navigate the complexities of a changing climate and safeguard its people, environment, infrastructure and economies. This approach helps minimize the risks and impacts associated with climate-related hazards. Addressing climate change in hazard mitigation help enhance safer, healthier, and more sustainable communities.

5 Integrating Access and Functional Needs (AFN) into Hazard Mitigation

5.1 AFN Introduction

Modern hazard mitigation planning increasingly recognizes that resilient communities must address the needs of all residents –including those with access and functional needs (AFN). Historically, individuals with disabilities (i.e. including but not limited to, youth, those economically depressed, pregnant, etc.), chronic health conditions, language barriers, or transportation disadvantages have been underrepresented in emergency planning. As evidenced by the best practices for stakeholder inclusion and further supported by national preparedness frameworks, integrating AFN considerations leads to plans that are more inclusive and effective. By proactively engaging AFN populations and support agencies in every phase, from preparedness through recovery, a hazard mitigation plan can reduce losses, improve evacuation and sheltering outcomes, and build trust between emergency management agencies and the communities they serve.

5.2 Inclusion of AFN and Vulnerable Populations in Planning

A major component of effective mitigation planning is a "whole community" approach. Incorporating AFN voices into the planning process is crucial because these stakeholders offer real-world insights into the challenges they face during emergencies. Key steps to this process include, but are not limited to:

- **Stakeholder Engagement:** Ensure that representatives from disability advocacy groups, community-based organizations, and service providers (such as local health departments and transportation agencies) are engaged early in the planning process. Their firsthand experiences help identify practical barriers that might otherwise be overlooked.
- **Public Participation:** Incorporating public stakeholders through meetings, surveys, and other outreach to capture the diverse needs of AFN populations. This input is vital to overcoming historical marginalization and ensuring that mitigation actions are relevant and equitable to the entire population.
- **Ongoing Interagency Collaboration:** Develop a hazard mitigation planning advisory committee and interagency working groups that include AFN stakeholders. These groups can guide both the planning process and the review of existing plans, ensuring that AFN issues are fully integrated from the outset.

5.2.1 Integrating AFN into the Overall AHMP

Integrating AFN considerations is not a stand-alone task; it must be interlaced throughout the entire hazard mitigation planning process. This includes:

- **Risk Assessments:** Incorporate AFN data into all risk assessments to ensure that the specific vulnerabilities of these populations are reflected in hazard maps and vulnerability index data.
- **Mitigation Strategy Development:** Ensure that every mitigation action is examined for its impact on AFN populations. For example, when planning for flood control or wildfire prevention projects, review how these projects can be improved to meet the needs of people with access and functional needs.
- **Plan Review and Update:** Ensure planning processes include regular AFN review and updates. Includes but not limited to:
  - Surveys of community needs
  - Consultations with AFN advisory groups
  - Integration of new technological or infrastructural solutions
- **Funding and Resource Allocation:** Clearly identify funding streams and resource commitments for AFN-specific projects. This could involve targeted grants from federal programs (e.g., Hazard Mitigation Assistance), state funding dedicated to accessible infrastructure improvements, and local resources such as the Productivity Investment Fund that can be accessed to improve the effectiveness and efficiency of County operations.

5.3 Assessment of AFN Needs

Understanding the specific needs of AFN populations requires both quantitative and qualitative approaches:

- **Data Collection and Risk Assessment:** Use existing resources, community surveys, outreach and risk assessments to help identify the number and types of individuals with AFN at the local community level. Evaluate the regional geographic distribution, vulnerabilities, and specific requirements before and after emergencies.

- **Frameworks for Analysis:** Adopt structured methodologies such as C-MIST (Communication, Maintaining Health, Independence, Support, Safety, and Transportation) to assess/ document AFN requirements.



- **C-MIST Explanation**
  - **Communication**: Individuals with hearing, vision, cognitive, or speech limitations may require alternative communication methods to receive or express information during emergencies.
  - **Medical / Health Needs**: People with complex medical conditions rely on medications, medical equipment, or specialized care to maintain their health and prevent complications.
  - **Independence**: Those who use mobility devices, assistive technology, or service animals need uninterrupted access to maintain their independence and daily functions.
  - **Supervision & Safety**: Some individuals require continuous support for safety, comfort, or emotional well-being, including those with memory issues, psychiatric conditions, or intellectual disabilities.
  - **Transportation**: Individuals without personal transportation or with mobility limitations need accessible and reliable options, especially in emergencies and evacuations.
- **Integrating Vulnerability Assessments:** Leverage tools from local climate vulnerability assessments and hazard mitigation plan reviews to identify areas where AFN populations overlap with high-risk zones (e.g., flood plains,

wildfire-prone areas). This integration helps prioritize mitigation actions in regions where vulnerable populations are most exposed.

5.4 Coordination with AFN Support Agencies

Effective mitigation planning requires robust coordination with both governmental and nongovernmental agencies that serve AFN populations. Best practices include:

- **Formal Partnerships:** Establish relationships and partnerships with agencies such as public health departments, social services, transportation authorities, community-based organizations, and disability advocacy organizations. These partnerships ensure that there is clear, ongoing communication and that roles and responsibilities are delineated before, during, and after disasters.
- **Joint Training and Exercises:** Conduct regular joint meetings, and exercises that include AFN components and identify additional resources to support the needs of the AFN community. These actions will help prepare all stakeholders to work together during a crisis and help identify gaps in current plans.
- **Outreach and Information Dissemination:** Ensure that all information, both pre-incident preparedness messages, response measures and post-incident recovery plans are accessible to all audiences. This includes using multiple languages, various communication formats (e.g., large-print, audio, sign-language, and digital formats), and culturally appropriate messaging to reach all segments of the community.

5.5 AFN Conclusion

A hazard mitigation plan builds a foundation for a resilient, inclusive community. By ensuring that AFN and other vulnerable populations are included in every phase of planning, from initial stakeholder engagement to the development of tailored mitigation actions and coordinated response strategies, communities can minimize disaster impacts and foster long-term resilience. Drawing on best practices from national frameworks and local planning guides, and by implementing ADA-compliant shelter operations, emergency managers can create a plan that truly serves every member of the community. This inclusive approach not only saves lives and property during disasters but also strengthens community trust and the overall effectiveness of emergency management efforts.

6 Hazard Identification and Risk Assessment

6.1 Hazard Identification Overview

The hazard identification and risk assessment process provide a foundation for Los Angeles County's hazard mitigation planning efforts by identifying, profiling, and assessing the risks associated with natural, technological, and human-caused hazards. This section builds on the framework established in the 2020 Hazard Mitigation Plan, incorporating insights from the 2023 Operational Area Emergency Operations Plan (OAEOP), the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), the Los Angeles County Climate Vulnerability Assessment, the State of California Hazard Mitigation Plan (SHMP), and the Federal Emergency Management Agency (FEMA) National Risk Index.

Based on these sources hazards were included and addressed in the 2025 AHMP according to their frequency, severity and impact to Los Angeles County, see below Table 6-1. Hazards that did not meet the threshold of moderate risk will not be prioritized within the plan. Additionally, three new natural hazards (Extreme Heat, Drought, and Severe Wind/Tornado) and four human-caused hazards (Mass Violence, Cyber Incidents, Transportation Incidents, and Public Health Emergencies) are included in the 2025 AHMP.

Table 6-1 Hazard Inclusion/ Omission

Hazard	Comment
Earthquake	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Wildfire	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Heat Wave	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.
Tornado	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Tornado is incorporated with the Severe Wind/ Tornado hazard profile.
Land Movement	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County.

Hazard	Comment
Lightning	Hazard is included in the plan due to its high frequency, severity, and impact to Los Angeles County. Lightening is incorporated with the Wildfire and Flooding hazard profiles.
Flooding	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. The Flooding hazard profile incorporates both Riverine and Coastal Flooding.
Drought	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Strong Wind	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County. Strong Wind is incorporated with the Severe Wind and Tornado hazard profile.
Tsunami	Hazard is included in the plan due to its frequency, severity, and impact to Los Angeles County.
Winter Weather	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Hail	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Avalanche	Hazard is omitted from the plan due to its minimal frequency, severity, and impact to Los Angeles County.
Cold Wave	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Hurricane	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Ice Storm	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.
Volcanic Activity	Hazard is omitted from the plan due to its lack of frequency, severity, and impact to Los Angeles County.

Los Angeles County faces a wide range of hazards due to its geographic diversity, population density, and economic significance. The following hazards were identified and prioritized from the previously mentioned sources based on historical occurrences, potential impacts, and future risks:

1. Wildfire
2. Earthquake
3. Extreme Heat
4. Drought
5. Flooding
6. Dam Failure
7. Land Movement
8. Tsunami
9. Severe Wind and Tornado
10. Mass Violence
11. Cybersecurity Incidents
12. Transportation Incidents
13. Public Health Emergencies

Among these hazards, six were identified to be potentially exacerbated by climate change including wildfire, extreme heat, drought, flooding, land movement, and severe wind and tornadoes. Additional human-caused hazards were included based on the 2024 THIRA including mass violence, cybersecurity incidents, transportation incidents, and public health emergencies. The results of the public Personal Disaster Impact Survey validated that these hazards are of significant concern to county residents. A risk assessment table comparing hazards to critical infrastructure is in Appendix C.

Table 6-2 Changes in Development and Vulnerability

Hazard	Change (Increase/ Decrease)	Reason
Earthquake	No Change	While new construction adheres to modern seismic codes aging infrastructure in high seismic zones remain vulnerable. Continued population growth in older neighborhoods with limited

Hazard	Change (Increase/ Decrease)	Reason
		retrofitting increases overall exposure.
Wildfire (Lightning)	Increase in Vulnerability	Urban expansion into Wildland-Urban Interface (WUI) areas has increased the number of homes at risk. Post 2020 development in high fire severity zones has continued, though defensible space regulations and new fire-safe planning are improving resilience for new builds.
Extreme Heat	Increase in Vulnerability	Population density, urban heat islands, and development in inland valleys increases exposure. Older multi-family units without air conditioning remain a concern. More outdoor workers and people experiencing homelessness (PEH) add to vulnerable population.
Land Movement	Stable to Slight Increase	Most new development avoids known landslide-prone areas due to zoning and geotechnical review. However, climate-driven precipitation variability and wildfires continue to destabilize slopes in developed areas.
Flooding (Lightning)	Increase in Vulnerability	New impervious surfaces from development increase stormwater runoff. Older flood control infrastructure is strained under heavier, more frequent rain events.

Hazard	Change (Increase/ Decrease)	Reason
Drought	Increase in Vulnerability	Continued population growth and water demand in arid and semi-arid zones has outpaced gains in conservation. Agricultural vulnerability persists in high desert areas.
Severe Wind and Tornado	Increase in Vulnerability	Los Angeles County is experiencing more frequent and intense wind events, including tornadoes. As urban development expands, tree canopies and overhead utilities in densely developed areas continue to contribute to cascading hazards. In response, efforts are underway to underground utility lines in high-risk areas.
Tsunami	Stable	Revised tsunami inundation maps have refined the at-risk zones. New developments in coastal areas are largely outside the updated hazard areas or comply with stricter coastal building codes.
Dam Failure	Stable/ Slight Increase	While no new major dams have been constructed in recent years, downstream development continues to increase population and critical infrastructure exposure within inundation zones.



6.2 Wildfire

6.2.1 Nature



Wildfires are fast-moving, uncontrolled fires that consume vegetation and rapidly spread, often threatening lives, structures, and infrastructure. These fires can be ignited by natural causes, such as lightning, or human activities, including unattended campfires, downed power lines, and arson. The increasing frequency, duration, and intensity of wildfires in Los Angeles County are possibly linked to the changing climate, with hotter temperatures, prolonged droughts, and reduced humidity levels making the region highly susceptible to fires.

Factors Influencing Wildfire Behavior

- **Topography**: Fires spread more rapidly on steep slopes and are often driven by the Santa Ana winds.
- **Fuel Load**: Dense, dry vegetation and high tree mortality increase fire intensity.
- **Weather Conditions**: High temperatures, strong winds, and low humidity elevate fire risk, with the changing climate contributing to a lengthened fire season.

Wildfires also create secondary hazards such as poor air quality, landslides, flooding, and debris flows—especially in areas with recent burn scars where vegetation loss increases soil instability.

6.2.2 Location

Los Angeles County is one of the most wildfire-prone regions in the United States. Based on the Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) maps, significant wildfire risk exists in the Santa Monica Mountains, San Gabriel Mountains, Palos Verdes Hills, and Puente Hills. The 2024 THIRA and Los Angeles County Climate Vulnerability Assessment identify an increasing risk to communities located in or near these high-risk areas.

Los Angeles County has three primary wildfire management zones:

- **Federal Responsibility Areas (FRAs):** Lands administered or controlled by the federal government where federal agencies have administrative and protection responsibility for wildfires.
- **State Responsibility Areas (SRAs):** Wildland areas where CAL FIRE is responsible for suppression efforts.
- **Local Responsibility Areas (LRAs):** Developed regions where local agencies, such as Los Angeles County Fire Department (LACoFD), provide fire protection.

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A. Included in Appendix A are several Fire Hazard Severity Zone maps for reference.

6.2.3 Extent

According to CAL FIRE's Fire Hazard Severity Zone (FHSZ) maps, Los Angeles County contains:

- 386.06 square miles (8.11%) classified as Very High Fire Hazard Severity Zone (FHSZ) in Local Responsibility Areas, LRAs.
- 625.01 square miles (13.13%) classified as Very High (FHSZ) in State Responsibility Areas, SRAs.

Wildfires pose a significant threat not only through the immediate damage they cause to lives, property, and natural resources, but also through the secondary hazards that continue after the flames are extinguished.

In the aftermath of a fire, communities often face increased risks of flash floods, debris flows, and degraded air quality. These post-fire impacts can compound the initial destruction, placing additional strain on infrastructure, health systems, and recovery efforts.

6.2.4 History

Los Angeles County has experienced numerous devastating wildfires in recent decades, including:

- **Canyon Fire (1968) –** Burned 22,000 acres, destroyed 147 homes, and led to mass evacuations.
- **Old Topanga Fire (1993) –** Consumed 16,516 acres, destroying 388 structures and causing three fatalities.
- **Sayre Fire (2008) –** Destroyed 489 structures, including over 600 mobile homes.
- **Station Fire (2009) –** The largest fire in Los Angeles County history, burning 160,577 acres, destroying 209 structures, and causing two firefighter fatalities.
- **Woolsey Fire (2018) –** Burned 96,949 acres, destroyed 1,643 structures, and resulted in three fatalities.
- **Bobcat Fire (2020) –** Scorched 115,796 acres, destroying 171 structures and damaging numerous infrastructures in the Angeles National Forest.
- **Palisades Fire (2025) –** Resulted in significant destruction and loss of life, burning 23,707 acres, destroyed approximately 6,833 structures, and causing 12 civilian fatalities.
- **Eaton Fire (2025) –** Resulted in significant destruction and loss of life, burning 14,021 acres, destroying approximately 9,418 structures, and causing 17 civilian fatalities.

These fires highlight the increasing frequency and intensity of wildfires, emphasizing the urgent need for stronger mitigation and preparedness efforts.

The Los Angeles County area has experienced federally declared wildfires and are shown in the table below. There have been no state proclamations for wildfires in the last five years.

Federally Declared Wildfire/Fire Management Assistance Declaration in Los Angeles County from 1/1/2020 to 3/28/2025

Date	Incident Name	No.	Category
1/8/2025	California Wildfires and Winds	4856	Federal Declaration
1/8/2025	California Eaton Fire	5550	Fire Management Assistance Declaration
1/8/2025	California Hurst Fire	5551	Fire Management Assistance Declaration
1/7/2025	California Palisades Fire	5549	Fire Management Assistance Declaration
12/10/2024	California Franklin Fire	5548	Fire Management Assistance Declaration
9/11/2024	California Bridge Fire	5537	Fire Management Assistance Declaration
10/16/2020	California Wildfires	4569	Federal Declaration
9/13/2020	California Bobcat Fire	5374	Fire Management Assistance Declaration

6.2.5 Probability

With several guaranteed wildfires each year, the probability of wildfire ignition in Los Angeles County is gradually increasing, driven largely by climate change. There is a 100% chance of a fire occurring each year within the geographic planning area. Historically, wildfires occurred between June and November, but recent years have shown a year-round fire season due to hotter, drier conditions and more intense weather variability.

Longer dry periods, reduced humidity, and increased temperatures, coupled with historic drought and vegetation die-off, have created critically dry fuel beds. These events make even small ignition sources capable of generating major wildfires.

Santa Ana winds continue to serve as a major accelerant, contributing to rapid fire spread and severe fire behavior. When combined with urban encroachment into fire-prone areas, these conditions elevate both the frequency and destructiveness of wildfires.

Projections from the 2024 THIRA and the LA County Climate Vulnerability Assessment confirm that wildfire probability will continue to rise unless significant fuel reduction, land use planning, and climate adaptation strategies are implemented across all jurisdictions.

The 2024 THIRA estimates that:

- Over 1.2 million residents live in high-risk wildfire zones.
- Communities near the Wildland-Urban Interface (WUI) are at the greatest risk, especially those with limited evacuation routes, and the Access and Functional Needs community.
- Vulnerable populations, including seniors, low-income households, and people with disabilities, face heightened challenges during evacuations.

6.2.6 Vulnerability

Los Angeles County faces high wildfire vulnerability due to its extensive Wildland-Urban Interface (WUI), with over 1.2 million residents that live in Very High Fire Hazard Severity Zones (FHSZs). These communities are particularly susceptible because many homes lack defensible space, fire-resistant construction, or adequate emergency access.

Vulnerable populations including (but not limited to): seniors, individuals with disabilities, low-income households, and those dependent on electrical medical equipment, face significant evacuation and health risks during wildfire events, especially in WUI communities with limited ingress/egress and high fuel loads.

SUPERVISORIAL DISTRICT BREAKDOWN		
Supervisorial District	**Population in High-Risk Wildfire Zones**	**Percentage of District Population**
District 1	**150,000**	**12%**
District 2	**75,000**	**6%**
District 3	**425,000**	**30%**
District 4	**250,000**	**20%**
District 5	**500,000**	**32%**

Contextual Overview

Very High FHSZ in LRA jurisdiction includes dense hillside residential areas under local fire authority responsibility. These are some of the most vulnerable communities due to terrain, vegetation, and constrained emergency access.

Critical infrastructure is also at risk, with wildfire exposure threatening fire stations, law enforcement facilities, hospitals, utilities, transportation corridors, and emergency communication systems. Disruption to these essential services during wildfire events can compound vulnerabilities and delay response and recovery. For a better understanding of critical infrastructure at risk please see Appendix C.

Total Facilities Affected:

- **Very High LRA**: 120
- **High SRA**: 8
- **Very High SRA**: 76

With the continued expansion of developments into fire-prone areas has significantly increased wildfire risk. Many homes in the WUI lack proper defensible space and fire-resistant building materials, making them particularly vulnerable. Additionally, limited evacuation routes in some WUI communities create challenges for emergency response and evacuations. Stricter zoning laws, building regulations, and vegetation management policies are the best practices to reduce risk.

Department/ Agency	Very High FHSZ (LRA)	High FHSZ (SRA)	Very High FHSZ (SRA)
Animal Care and Control	1	0	1
Fire Department	39	1	14
Health Services	1	0	0
Library	7	1	2
LACMA / NHM	1	0	0
Office of Education	3	0	3
Other County Offices	0	0	0
Parks & Recreation	13	1	12
Public Health	52	4	41
Public Works	0	0	0
Sheriff's Department	3	1	3

Wildfires threaten essential infrastructure, including:

- **Transportation**: Damage to roads and bridges affects evacuation and emergency response.
- **Utilities**: Power lines, gas pipelines, and water infrastructure, including dams, are vulnerable to fire damage.
- **Emergency Services**: Public safety and healthcare facilities near wildfire-prone areas face operational disruptions.
- **Public Services**: Parks, libraries, schools, and other public areas could be lost or damaged.

New emerging patterns suggest that climate change may be influencing wildfire risks in Los Angeles County through:

- **Extending fire seasons:** Historically, peak fire season occurred from June to November, but fires are now starting and burning year-round.
- **Increasing fuel dryness:** Higher temperatures and prolonged droughts reduce vegetation moisture levels, making fires more intense.
- **Raising fire frequency:** Hotter, drier conditions contribute to more frequent ignitions, particularly in WUI areas.

Extent of Exposure

- **Total Area Exposed**: 243.72 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD3**: 117.95 sq mi (27.29%)
    - **SD5**: 95.61 sq mi (3.36%)
    - **SD1**: 16.23 sq mi (4.60%)
    - **SD4**: 9.10 sq mi (4.27%)
    - **SD2**: 4.83 sq mi (1.33%)

For a better visual representation of this Wildfire Hazard within the LA County planning area, please reference Appendix A for several Fire Hazard Severity Zone maps.

6.2.7 Impacts

Impacts for past fires vary depending on scope and severity, including the January 2025 fires, including the Palisades and Eaton Fires, resulted in widespread destruction across Los Angeles County, burning over 37,000 acres and destroying more than 16,000 structures combined, with nearly 30 civilian fatalities. These events caused cascading impacts such as prolonged power outages, degraded water pressure affecting firefighting and residential supply, and overwhelmed emergency services. Transportation routes and communications infrastructure were disrupted. Communities, especially in the Wildland-Urban Interface (WUI), experienced major economic losses due to the destruction of homes, businesses, and public facilities. Post-fire hazards like debris flows and landslides further compounded recovery challenges, with water infrastructure contamination and sedimentation requiring emergency remediation. The scope and severity of these fires underscore the increasing vulnerability of critical infrastructure and the urgent need for enhanced mitigation strategies across high-risk zones.

Problem Statement

Many hillside communities within LRA Very High FHSZ zones face critical access and water supply issues during fires. These areas often include aging structures and narrow roads, complicating firefighting and evacuation. Investments in defensible space, local code enforcement, and community wildfire protection planning are vital to saving lives and minimizing losses.

6.2.8 Mitigation and Preparedness

Los Angeles County is implementing a multi-agency approach to mitigate wildfire risks.

Key strategies include:

- **Community Wildfire Protection Plans (CWPPs):** Strengthening fire prevention measures in high-risk areas.
- **Community Preparedness:** Educating residents on wildfire readiness through outreach campaigns, emergency alert systems, and neighborhood preparedness programs.
- **Defensible Space Requirements:** Enforcing brush clearance around structures.
- **Enhanced Building Codes:** Promoting fire-resistant materials for new developments.
- **Vegetation Management:** Reducing fuel loads through prescribed burns and hazardous tree removal.
- **Evacuation Planning:** Improving coordination between OEM, LASD, LACoFD, and other jurisdictions to ensure clear evacuation policies and procedures.

Additional details on the County's proactive and ongoing efforts to reduce wildfire risk, including long-term planning, infrastructure hardening, and community-based initiatives, is located in the dedicated section titled "Mitigation Strategies."

6.2.9 Summary

Wildfires remain one of the most significant hazards in Los Angeles County, posing risks to life, property, and critical infrastructure. The expansion of development into WUI areas, increasing fire severity due to climate change, and ongoing challenges with evacuation and mitigation require proactive, coordinated efforts across agencies. Strengthening fire prevention policies, improving emergency response coordination, and integrating climate adaptation measures are essential to enhancing wildfire resilience for Los Angeles County.



6.3 Earthquake

6.3.1 Nature



Earthquakes occur due to the sudden release of energy in the Earth's crust, generating seismic waves that cause ground shaking. These events, often triggered by movement along fault lines, vary in intensity depending on factors such as magnitude, depth, and proximity to populated areas. In addition to the initial shaking, secondary hazards such as surface faulting, liquefaction, landslides, tsunamis, and aftershocks can worsen the damage. Los Angeles County, located in a highly active seismic region, faces significant risks from these natural events, necessitating extensive mitigation efforts and preparedness planning.

- The most common effects of earthquakes include violent shaking, structural damage, and disruptions to infrastructure.
- Secondary effects can include, but are not limited to, utilities outages, traffic congestion and transportation systems being impassable, and an increase of fire risks, from broken gas and water lines.

- Earthquakes occur with little to no warning, making preparedness essential for minimizing loss of life and property.

6.3.2 Location

Los Angeles County is one of the most seismically active regions in the United States, with multiple active fault systems capable of generating destructive earthquakes.

Major faults include:

- San Andreas Fault – Capable of M 8.0+
- Newport-Inglewood Fault – M 7.4
- Malibu Coast Fault System – M 6.7
- San Fernando Fault – M 6.6
- Santa Monica Fault – M 7.0
- Whittier Fault – M 7.2
- Sierra Madre Fault – M 6.0-7.0

For a better visual representation of this Earthquake Hazard within LA County planning area, please reference Appendix A for earthquake fault maps.

6.3.3 Extent

According to US Geological Survey, there are two types of earthquake measurements, magnitude (Mw) and intensity (i). Magnitude is a measure of the energy released at the source of the earthquake. Intensity scale help measure impact on people and structures.

Earthquake impact is based on magnitude scale is as follows:

- Great–Mw > 8,
- Major–Mw = 7.0 – 7.9
- Strong–Mw = 6.0 – 6.9
- Moderate–Mw = 5.0 – 5.9
- Light–Mw = 4.0 – 4.9
- Minor–Mw = 3.0 – 3.9
- Micro–Mw < 3

Modified Mercalli Intensity Scale is from I to XII, which refers I, as not felt and XII as extreme.

Figure 6.3.1 Modified Mercalli Intensity Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant. Buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

Over 75% of unincorporated Los Angeles County is at risk for severe to extreme shaking in a future earthquake.

The region's dense urban environment, combined with aging infrastructure, increases the likelihood of extensive damage and prolonged recovery times.

Faults running beneath critical infrastructure corridors, including freeways and power grids, pose a significant threat to public safety and economic stability of the planning area.

6.3.4 History

Los Angeles County has a long history of destructive earthquakes, with some of the earliest recorded events dating back to the early 19th century. The San Juan Capistrano Earthquake of 1812 (M 7.5) was among the first to be documented, causing the collapse of Mission San Juan Capistrano and resulting in 40 fatalities. Over the years, the county has experienced numerous significant quakes, including the devastating 1857 Fort Tejon Earthquake (M 7.9), the 1971 San Fernando Earthquake (M 6.6), and the infamous 1994 Northridge Earthquake (M 6.7), which caused billions in damages and led to widespread infrastructure failures. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Major Earthquakes in Los Angeles County (1812 – Present)

Date	Magnitude	Name / Location	Notable Impact
December 8, 1812	7.5	San Juan Capistrano Earthquake	Destroyed Mission San Juan Capistrano, killed 40 people.
December 21, 1812	7.1	West Ventura Earthquake	Caused significant shaking in Southern California.
January 9, 1857	7.9	Fort Tejon Earthquake	Largest earthquake on the San Andreas Fault; ruptured 225 miles.
July 21, 1952	7.5	Kern County Earthquake	Strong shaking felt in Los Angeles; major damage to Bakersfield.
February 9, 1971	6.6	San Fernando Earthquake	65 deaths, $553 million in damages, collapse of Veterans Hospital.
October 1, 1987	5.9	Whittier Narrows Earthquake	8 deaths, 200 injuries, $358 million in damages.
February 28, 1990	5.7	Upland Earthquake	30 injuries, $12.7 million in damages.

June 28, 1991	5.6	Sierra Madre Earthquake	1 death, 100+ injuries, $40 million in damages.
January 17, 1994	6.7	Northridge Earthquake	57 deaths, 8,700 injuries, $40 billion in damages, freeways collapsed.
July 29, 2008	5.5	Chino Hills Earthquake	8 injuries, minor structural damage.
March 28, 2014	5.1	La Habra Earthquake	Few injuries, $10 million in damages.
July 6, 2019	7.1	Ridgecrest Earthquake	Widespread damage in Southern California, infrastructure impacts.

6.3.5 Probability

Trends in Seismic Activity

Over 163 earthquakes of M 5.0 or greater have been recorded in Southern California since 1812.

The San Andreas Fault remains the greatest seismic hazard, with a 59% chance of an M 6.7+ event in the next 30 years.

Future Earthquake Occurrence

The U.S. Geological Survey (USGS) estimates the following probabilities for a major earthquake in Los Angeles County in the next 30 years:

- 60% chance of an M 6.7+ earthquake
- 46% chance of an M 7.0+ earthquake
- 31% chance of an M 7.5+ earthquake

6.3.6 Vulnerability

The county's vulnerability to earthquakes extends beyond physical infrastructure, affecting its residents and essential services. Older buildings, particularly unreinforced masonry and soft-story structures, are at high risk of collapse, posing significant

dangers to residents and businesses. Seismic retrofitting, early warning systems, and stricter building codes have improved resilience, but vulnerabilities remain in older structures and critical infrastructure.

Critical Infrastructure at Risk

- **Highways, bridges, and transportation routes:** A major earthquake could severely disrupt mobility, shipment of goods and services while also delaying emergency response and evacuations. Major highways such as, but not limited to the I-5, I-10, US-101, CA-60, CA-14, I-405, I-710, and I-105 could be impacted.
- **Energy grids and water system:** Disruptions could leave millions without power and clean water.
- **Hospitals and emergency services:** 325 hospitals and 1,299 fire stations in the Los Angeles County could suffer functional impairments.
- **Unreinforced masonry and soft-story buildings:** Many older structures are highly susceptible to collapse during strong ground shaking.

County Specific Critical Facilities Affected:

- Fire Department: 314 facilities (93.18%)
- Public Works: 201 facilities (87.39%)
- Health Services: 56 facilities (85.71%)
- Public Health: 37 facilities (92.50%)
- Libraries: 78 branches (89.66%)
- Parks: 179 (97.79%)
- Education: 70 (85.37%)

Los Angeles County lies at the intersection of multiple major fault lines, including the San Andreas Fault. According to the hazard matrix, the risk of violent ground shaking is prevalent countywide, particularly in urban centers and regions with critical infrastructure. The potential consequences of violent seismic shaking include widespread structural damage, disruption of services, economic losses, and human casualties.

Populations at Risk

- The THIRA estimates over 2 million residents could be significantly impacted in a major seismic event, particularly those in high-risk seismic zones.

- People Experiencing Homelessness (PEH) populations: 75,000+ unhoused individuals in Los Angeles County live in areas at risk of violent shaking.
- Low-income and individuals with access and functional needs (AFN): For more details on impacted population please see Section 5.

Extent of Exposure

- **Total Area Exposed**: 3,041.91 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 1,950.78 sq mi (69.50%)
    - **SD3**: 379.41 sq mi (87.99%)
    - **SD1**: 349.17 sq mi (98.95%)
    - **SD2**: 362.95 sq mi (99.99%)
    - **SD4**: 210.92 sq mi (99.10%)

6.3.7 Impacts

Los Angeles County has a long history of experiencing damaging earthquakes due to its location along multiple active fault systems, including the San Andreas, Newport-Inglewood, and Whittier faults. Historic earthquakes such as the 1971 San Fernando (M6.6) and 1994 Northridge (M6.7) events caused catastrophic losses. The San Fernando earthquake resulted in 65 deaths, the collapse of hospital structures, and over $550 million in damages, while the Northridge earthquake caused 57 deaths, more than 8,700 injuries, and an estimated $40 billion in economic losses, including widespread infrastructure failures such as collapsed freeways and damaged utility systems.

Impacts from future major seismic events are projected to be even more severe due to population density, aging infrastructure, and increasing development in seismically vulnerable areas. Over 75% of unincorporated Los Angeles County is at risk of severe to extreme ground shaking. Current estimates suggest that a large-magnitude earthquake could displace up to 2.2 million people, injure or kill thousands, and result in over $200 billion in combined economic losses, including $113 billion in property damage and $68 billion in business interruptions.

The County's critical systems; power, water, transportation, healthcare, and communications, are especially vulnerable. A major earthquake could impair up to 325 hospitals and 1,299 fire stations and disrupt critical infrastructure for millions. Populations with heightened vulnerability include the 75,000+ people experiencing homelessness, those with access and functional needs, and residents of older, unreinforced masonry and soft-story structures.

Without sufficient mitigation, a future earthquake could result in cascading failures across multiple sectors and prolong the County's recovery for years. These risks highlight the urgency for continued investment in seismic retrofitting, stricter enforcement of building codes, expanding statewide early warning systems, and equitable preparedness programs targeting at-risk vulnerable populations.

- **Casualties and injuries:** Depending on the time of day and location, thousands could be injured or killed in a severe earthquake.
- **Economic disruption:** A significant earthquake could halt business operations, damage supply chains, and force thousands into unemployment.
- **Housing displacement:** An estimated 2.2 million residents could be displaced, with tens of thousands requiring emergency sheltering.

Economic Impact

A major earthquake in Los Angeles County could result in over $200 billion in economic losses, with a total of $118 trillion-dollar exposure. Losses can include:

- $68 billion in business interruptions
- $51 billion in lost economic activity
- $113 billion in property damages

Problem Statement

The pervasive exposure of Los Angeles County to violent earthquake shaking presents a systemic threat to public safety, economic stability, and essential services. Nearly all major departments and infrastructure elements are located within high-shaking hazard zones. The extensive reach across all five Supervisorial Districts (SD) amplifies the challenge, highlighting the urgent need for retrofitting, public education, preparedness programs, and resilient design policies. Failure to address this hazard could lead to catastrophic loss of life and functionality in the event of a major seismic event.

6.3.8 Mitigation and Preparedness

Efforts to reduce earthquake risks in Los Angeles County include strengthening building codes, enhancing emergency preparedness, and retrofitting vulnerable structures.

Key efforts to mitigate earthquake risks include:

- Strengthening building codes and enforcing retrofitting laws
- Upgrading critical infrastructure
- Expanding public education and early warning systems
- Enhancing emergency response planning

By proactively implementing these measures, Los Angeles County aims to reduce casualties, infrastructure damage, and economic losses in future seismic events.

Seismic Retrofitting Programs

- **Soft story retrofit program**: Mandates seismic upgrades for older apartment buildings.
- **Non-ductile concrete building retrofits**: Strengthens older commercial and residential structures.
- **Hospitals and emergency facilities retrofitting**: Ensures critical services remain operational post-earthquake.

Policy and Regulatory Measures

- Assembly Bill (AB) 1857: Strengthens building standards for multi-story structures.
- AB 2681: Requires cities and counties to inventory vulnerable buildings.
- Updated California Building Code (CBC): Enforces stricter seismic design criteria for new construction.
- Public Education: Teaching to Drop, Cover and Hold On; the household preparedness checklist, educate residents on emergency response, retrofitting, and disaster preparedness.
- Early Warning/ ShakeAlert System: Provides real-time earthquake early warnings to residents via mobile alerts and public messaging.
- Public earthquake drills: Annual Great California ShakeOut encourages preparedness.

6.3.9 Summary

Los Angeles County remains at high risk for devastating earthquakes, with scientific projections indicating a strong likelihood of a significant seismic event in the coming decades. The region has experienced numerous historic earthquakes, and the potential for future large-scale disasters remains ever-present. While advances in engineering, emergency preparedness, and mitigation efforts have improved resilience, challenges persist, particularly regarding aging infrastructure and vulnerable communities. Continued investments in retrofitting, public education, and early warning systems will be critical in minimizing casualties, economic losses, and recovery challenges in future earthquakes.



6.4 Extreme Heat

6.4.1 Nature

Extreme heat refers to prolonged periods of high temperatures, often accompanied by high humidity, posing significant health risks such as heat exhaustion and heat stroke. The urban heat island (UHI) effect, prevalent in densely built areas like Los Angeles County, intensifies these conditions by absorbing and retaining heat. The changing climate conditions through time in the region exacerbate for the rising of daily temperature and for the increasing of extreme heat days in the County. This leads to health issues, increase energy demand, and strain on infrastructure.



6.4.2 Location

Los Angeles County is particularly susceptible to extreme heat due to its diverse geography and urban density. All of Los Angeles County may experience extreme heat, nonetheless inland regions, including the valleys and high desert areas experience

higher temperatures compared to coastal areas. The urban heat island (UHI) effect can increase temperatures in cities and developed areas than the less developed areas. Urban centers with extensive concrete and asphalt surfaces further amplify heat retention, contributing to elevated temperatures and increased UHI effect in the county.

6.4.3 Extent

The severity of heat events in Los Angeles County has been increasing. Projections indicate a significant rise in the frequency and intensity of heat waves, with inland areas potentially experiencing temperatures exceeding 110°F. The urban heat island effect can cause urban areas to be several degrees warmer than their rural counterparts, exacerbating the impact of heat waves. The chart below shows the levels of heat wave impacts used to measure heatwave severity. HeatRisk, an experimental measure developed by the NWS in collaboration with the CDC, classifies heat events by their impact on human health. It ranges from Green (0) which is little or no risk to Magenta (4), which means extreme heat with no overnight relief.

Category	**Figure 6.4.1 Risk of Heat-Related Impacts**
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

National Weather Service (NWS), 2024

August, being the hottest month of the year that the planning area experiences the Figure 6.4.2 below shows, the average high temperature for August 2024 in Los Angeles County. As shown, the temperature varies by location but remains higher than average monthly temperature.

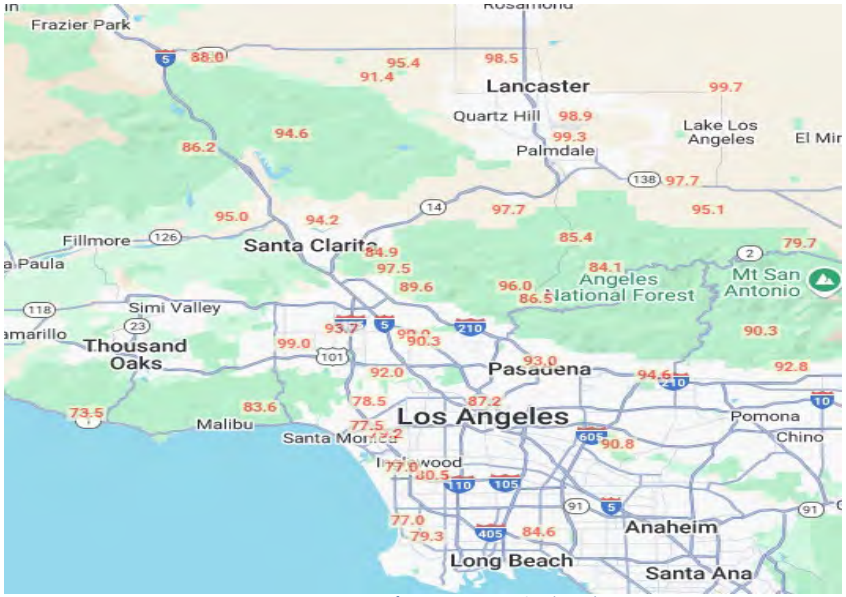


Figure 6.4.2, Mean Max Temperature for August 2024, National Weather Service

6.4.4 History

Because of the changing climate conditions and the geographical location, Los Angeles County has been experiencing extreme heat waves in the past years. It has a history of extreme heat events, with temperatures frequently reaching 100 degrees or more, especially during the summer months. In some cases, these extreme heat events are record-breaking heat waves surpassing their all-time highs.

Extreme Heat events include:

- **August 2020:** A severe heatwave led to widespread power outages, affecting nearly 500,000 residents.

- **September 2020:** The San Fernando Valley recorded a record high temperature of 121°F.
- **August 2022:** A record-breaking heatwave in late summer exceeded 100°F
- **September 2024:** A severe September heatwave pushed temperatures 10-20°F above normal, hitting 109°F in Long Beach

The History of Extreme heat events highlight the increasing trend of extreme heat occurrences in the region. There have been no federal declarations or state proclamations for extreme heat in the last five years. Even though there were no declared extreme heat emergencies, the county has issued several heat alerts and taken measures to protect residents from the impacts of heat waves during these periods.

6.4.5 Probability

Extreme heat events are an annual occurrence in Los Angeles County, though severity of such events vary per year based on other conditions, such as El Niño. Climate models project a substantial increase in the likelihood of extreme heat events in Los Angeles County. By mid-century, the county could experience more than five major heat waves annually, with some models suggesting up to tenfold increases in frequency. This heightened probability necessitates proactive mitigation and adaptation strategies.



Figure 6.4.3, Average Temperature 1900-2025, NOAA, NCEI, 2025.

6.4.6 Vulnerability

Extreme heat poses a significant and growing threat to Los Angeles County, where rising temperatures, urban heat islands, and widespread social vulnerability intersect. Those most at risk include the elderly, low-income households lacking air conditioning,

people experiencing homelessness (PEH), individuals with access and functional needs (AFN), and the County's large population of outdoor and non-air-conditioned indoor workers. Infrastructure is also strained; electricity demand spikes during heatwaves, often overwhelming the power grid and triggering outages. Water systems experience increased demand and evaporation losses, while roadways and rail lines are subject to buckling or operational delays. In recent years, Los Angeles County has experienced severe consequences from prolonged heat events, reinforcing the urgent need for heat resilience strategies targeting both people and critical services.

Los Angeles County-Specific Impacts and Data

- 491,600 residents experienced power outages during the August 2020 heatwave.
- 96% of the County's 1,000 miles of high-voltage transmission lines are exposed to moderate to high extreme heat risk.
- 1.7 million residents are considered highly vulnerable due to age, income, disability, or chronic health conditions.
- Over 300,000 outdoor workers are at elevated risk for heat-related illness and injury.
- Thousands of heat-related emergency visits occurred during multi-day heat events in 2020 and 2022; especially in neighborhoods with limited shade and high surface temperatures.
- 50+ cooling centers have been activated across the County during recent heatwaves to support at-risk populations.
- High heat contributes to worsened air quality, increased wildfire smoke exposure, and economic losses due to infrastructure damage, productivity decline, and rising healthcare costs.

6.4.7 Impacts

Los Angeles County has faced significant and growing impacts from extreme heatwaves over the past two decades. In August 2020, a prolonged heatwave caused rolling blackouts affecting nearly 500,000 customers, overwhelmed the state's electrical grid, and forced the activation of emergency conservation protocols. That same summer, the San Fernando Valley hit 121°F, leading to widespread strain on

HVAC systems and increased emergency room visits for heat-related illnesses. The 2022 and 2024 heatwaves brought similar conditions—temperatures over 100°F across the region led to localized transformer failures, asphalt buckling, and strain on water delivery systems due to elevated demand. During these events, outdoor workers, the elderly, and low-income residents without access to cooling systems were among the most affected. Economic activity was disrupted, with reports of business closures, service delays, and increased healthcare costs. In 2024, Long Beach reached a record 109°F, causing a spike in electricity demand and triggering emergency energy alerts across Southern California. Heat-related deaths and hospitalizations have also trended upward, particularly in neighborhoods with low tree canopy and high impervious surfaces. These impacts underscore the need for resilient infrastructure and targeted adaptation strategies to safeguard health and essential services.

6.4.8 Mitigation and Preparedness

The most effective way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that has individual strategies to effectively manage heat waves during peak seasons of the year. The plan might include forecasting and monitoring, education and awareness, and heat wave response.

To address extreme heat, Los Angeles County has implemented several measures:

- **Cooling Centers:** Establishment of air-conditioned public spaces where residents can seek relief during heatwaves. These centers are facilities such as libraries, community centers, and senior centers. Residents can locate the nearest cooling center using resources provided by the county. *Additional resources can be found at https://ready.lacounty.gov/heat/*
- **Urban Greening Initiatives:** Programs aimed at increasing green spaces, planting trees, and creating parks to provide shade and reduce ambient temperatures. These efforts help mitigate the urban heat island effect.
- **Public Awareness Campaigns:** Educational initiatives to inform residents about heat risks, prevention strategies, and resources available during extreme heat events. These campaigns emphasize the importance of hydration, recognizing heat-related illness symptoms, and utilizing cooling centers.
- **Building Codes and Regulations:** Incorporation of heat-mitigating designs and materials in new constructions and retrofits, such as cool roofs and reflective

pavements, to reduce heat absorption. These measures aim to lower indoor temperatures and decrease reliance on air conditioning.

These strategies are designed to reduce heat exposure, protect vulnerable populations, and enhance community resilience against extreme heat events.

6.4.9 Summary

Extreme heat poses a growing threat to Los Angeles County, with increasing frequency and intensity of heat waves exacerbated by urban heat island (UHI) effects. Understanding these impacts of extreme heat and taking appropriate precautions, residents of Los Angeles County can protect themselves and their communities from this growing climate hazard. The county has undertaken various mitigation efforts, including the establishment of cooling centers, urban greening projects, public education campaigns, and the implementation of heat-conscious building practices. Ongoing adaptation and proactive planning are essential to safeguard public health, infrastructure, and the environment from the adverse effects of extreme heat.



6.5 Drought

6.5.1 Nature

Drought is a prolonged period of below-average precipitation that leads to water shortages, impacting agriculture, ecosystems, and urban water supplies. Unlike other natural disasters, drought develops gradually, making it difficult to predict and mitigate. In Los Angeles County, droughts are a recurring issue due to the region's arid climate and dependence on imported water supplies.

Drought severity is determined by its duration, intensity, geographic extent, and water demand. Climate change is exacerbating these factors, leading to hotter temperatures, reduced precipitation, and increased evaporation rates. Wildfires are also projected to increase in frequency and intensity during drought season.



There are four common classifications of drought:

- **Meteorological Drought**: A prolonged period of below-normal precipitation.

- **Hydrological Drought**: A reduction in surface and groundwater levels due to prolonged precipitation deficits.
- **Agricultural Drought:** A lack of soil moisture that affects crop growth and livestock sustainability.
- **Socioeconomic Drought:** When water shortages impact drinking water supplies, sanitation, public services, and economic activities.

6.5.2 Location

Drought is regional in nature and typically affects the entire Los Angeles County planning area. Given the county's reliance on imported water from the Sierra Nevada snowpack and the Colorado River, reduced availability of these sources significantly increases vulnerability.

6.5.3 Extent

Drought is a recurring natural hazard that can severely impact agriculture, water supply, ecosystems, and communities. To monitor and communicate drought conditions across the United States, the National Drought Mitigation Center (NDMC), in partnership with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA), produces weekly U.S. Drought Monitor maps. These maps categorize drought conditions into five levels based on intensity, duration, and impact on various sectors, including agriculture, water resources, and public health.

Each drought category reflects a different level of severity, from short-term dry conditions that may slow crop growth, to long-term, widespread water shortages that require emergency response. These classifications help decision-makers, farmers, and water managers respond appropriately to emerging or ongoing drought conditions. See Figure 6.5.1 below for more information.

Drought Categories and Associated Impacts:

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS
D4	EXCEPTIONAL DROUGHT	• Exceptional and widespread crop/pasture losses • Critical shortages of water in reservoirs, streams, and wells • Water emergencies and possible mandatory rationing • Severe impacts on ecosystems and wildlife habitats
D3	EXTREME DROUGHT	• Major agricultural losses and pasture failure • Widespread water shortages • Water use restrictions likely enforced • Increased risk of wildfires and heat-related stress
D2	SEVERE DROUGHT	• Crop and pasture losses becoming likely • Water shortages becoming common • Local governments may implement water restrictions • Hydropower generation and irrigation potentially impacted
D1	MODERATE DROUGHT	• Noticeable damage to crops and pastures • Water levels in streams and reservoirs begin to decline • Voluntary water-use restrictions may be requested • Some stress on fish and wildlife populations
D0	ABNORMALLY DRY	• Early signs of drought, with short-term dryness slowing planting and crop growth • If improving lingering water deficits as area recovers from drought • Pastures or vegetation may show signs of delayed recovery

Figure 6.5.1 Drought Categories and Associated Impacts

These classifications not only help guide resources and planning but also raise awareness about the broader consequences of prolonged dryness. Understanding the extent and severity of drought helps ensure timely response and mitigation efforts at local, state, and federal levels.

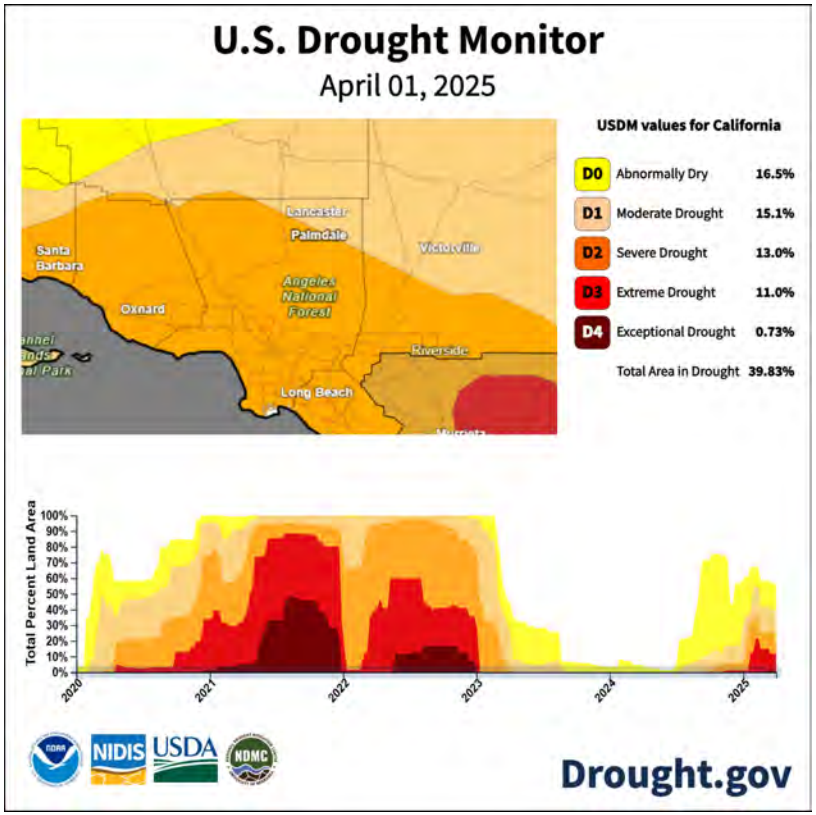


Figure 6.5.2, U.S. Drought Monitor, 2025

6.5.4 History

Los Angeles County has experienced multiple significant droughts, with some lasting several years. There have been no federal declarations or state proclamations for drought in the last five years.

Notable historical drought periods include:

1. 1917-1921 – A widespread drought affecting most of California.
2. 1976-1977 – One of the driest two-year periods in recorded history.
3. 1987-1992 – A six-year drought that severely impacted water supplies and agriculture.
4. 2007-2009 – A prolonged drought leading to state-imposed water restrictions.
5. 2011-2017 – The most severe drought in modern history, resulting in groundwater depletion and mandatory conservation measures.
6. 2020-2022 – California experienced a significant drought, with Los Angeles County experiencing "abnormally dry" conditions.
7. 2024-2025 – Los Angeles County is continuing to experience abnormally dry conditions, with lower average rainfalls and arid conditions.

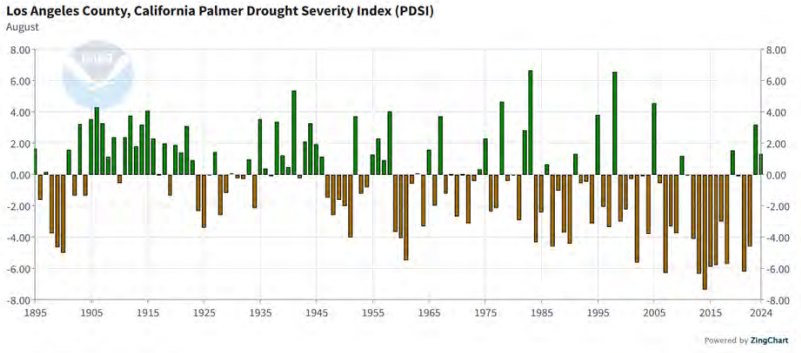


Figure 6.5.3, NOAA Drought Severity Index, 2024

The chart above, the Palmer Drought Severity Index, shows how drought conditions have been changing since 1895. The Palmer Drought Severity Index measures how dry or wet an area is by comparing rainfall and temperature to long-term averages. It gives a number (positive or negative) showing drought severity or excess moisture.

Los Angeles County was in some form of drought for 376 consecutive weeks from December 20, 2011, until March 14, 2019. The State and the County passed several resolutions and regulations at different times to mitigate drought impacts like water

conservation regulations. There were no federally declared drought disasters in the area in the past five years in the planning area.

6.5.5 Probability

Climate scientists predict that Los Angeles County and the rest of Southern California will get drier, while Northern California will get hotter. Rising temperatures contribute to higher evaporation rates and declining snowpack in the Sierra Nevada, a critical source of water for Southern California. The frequency of extreme droughts is expected to increase, reducing available water resources and heightening competition between urban, agricultural, and environmental needs. Long-term droughts have a 100% of occurring every ten-years, with potential for longer and more destructive drought events due to climate change.

6.5.6 Vulnerability

Los Angeles County's 10 million residents face growing vulnerabilities during prolonged droughts, with over 75% of community water systems exhibiting at least one drought-related risk, such as reliance on a single source or aging infrastructure. The County's dependence on imported water—serving over 60% of residents—increases exposure to supply disruptions from reduced Sierra Nevada snowpack and Colorado River allocations. All residents, and visitors of Los Angeles County are affected by water shortages during a prolonged drought conditions.

Vulnerabilities include:

- **Low-income households**, often lacking water-efficient appliances and cooling systems.
- **Agricultural industry** with over 140,000 acres of irrigated farmland in the County is at risk of reduced water allocation and drying pastures for livestock.
- **Wildland-urban interface (WUI) communities**, where over 1 million residents face heightened wildfire risk due to dry vegetation and limited firefighting water supply.
- **Critical infrastructure** operations may be impacted by a range of factors from reduced hydropower availability when reservoir levels decrease to power station cooling challenges.

These vulnerabilities illustrate the far-reaching, cross-sector impacts of drought on the County's economy, environment, and most at-risk communities.

6.5.7 Impacts

Over the past five years, Los Angeles County has experienced intensifying drought conditions marked by rising temperatures, reduced snowpack, and persistent water shortages. By 2022, 75% of the County's community water systems showed at least one drought vulnerability, including reliance on a single water source or aging infrastructure. Public health impacts have also emerged, with 1,113 cases of Valley fever reported in 2020, linked to dry soil and dust exposure. Hydropower reductions during drought periods increased reliance on natural gas, contributing to elevated energy costs for residents. These compounding impacts have strained water supply, health systems, and infrastructure, reinforcing drought as a major and growing hazard for Los Angeles County.

6.5.8 Mitigation and Preparedness

To combat increasing drought risks, Los Angeles County has implemented water conservation policies, infrastructure investments, and emergency response measures. Key strategies include:

Water Management and Conservation

- Expanding water recycling and desalination programs to reduce reliance on imported water.
- Implementing drought-tolerant landscaping initiatives to lower residential and commercial water use.
- Enforcing water efficiency regulations for new developments and upgrading older properties with water-saving strategies.

Infrastructure Improvements

- Enhancing groundwater recharge projects to increase local water storage.
- Upgrading stormwater capture systems to maximize water retention during rainy seasons.
- Developing new water storage facilities to provide additional supply resilience.

Community Preparedness and Public Awareness

- Launching county-wide conservation campaigns to encourage sustainable water use.
- Increasing financial incentives for water-efficient appliances and irrigation systems.
- Strengthening emergency drought response plans to ensure equitable water distribution during crises.

6.5.9 Summary

Drought remains a persistent and growing threat to Los Angeles County's water security and economic stability. Climate change projections indicate more frequent and severe droughts, placing greater strain on water supply systems, public health, and agriculture. By implementing proactive water management strategies, investing in infrastructure resilience, and promoting community awareness, the County can mitigate the long-term impacts of drought and ensure sustainable water resources for future generations.



6.6 Flooding

6.6.1 Nature

Flooding is a persistent and increasingly severe hazard in Los Angeles County, driven by heavy rainfall, storm surge, stormwater drainage, and rising sea levels. The county's complex hydrology, which includes rivers, creeks, and an extensive urban flood control system, is highly susceptible to overflow events when precipitation exceeds drainage capacity. The effects of climate change are exacerbating flood risks by intensifying storms, altering precipitation patterns, and increasing sea levels, leading to greater coastal inundation and inland flash floods.



Unlike other regions that experience seasonal flooding due to snowmelt, flooding in Los Angeles County primarily occurs during winter storms and atmospheric river events, which bring intense rainfall and lightning over short periods.

- The region's high degree of urbanization contributes to flash flooding, as paved surfaces prevent natural absorption of water, leading to rapid runoff and street flooding.

- Burn scars from recent wildfires further compound flood risks by reducing vegetation cover, destabilizing hillsides, and increasing the likelihood of land movement.

Flooding also creates secondary hazards, including erosion, infrastructure damage, water contamination, and transportation disruptions. Stormwater runoff can overwhelm wastewater treatment facilities, leading to hazardous spills. Landslides and mudflows in post-wildfire areas pose additional risks to homes, roads, and critical infrastructure. These compounding threats highlight the urgent need for comprehensive flood mitigation efforts to protect communities, infrastructure, and the environment.

6.6.2 Location

Flood hazards are geographically widespread, with more than 240 square miles of land located within the 100- and 500-year floodplains. Historically significant events, such as the 1938 and 1969 floods, as well as more recent storms in 2023 and 2024, have caused substantial damage to infrastructure, triggered evacuations, and challenged long-term recovery efforts. Socially vulnerable populations, including older adults, individuals with access and functional needs, and low-income households, face disproportionate impacts due to limited financial resources, inadequate insurance coverage, and reduced access to services. The County's flood control system includes concrete river channels, levees, storm drains, debris basins and reservoirs; has helped mitigate some flood risks but remains vulnerable to high-intensity storms that exceed design capacities.

Major Flood-Prone Areas:

- Los Angeles River, San Gabriel River, and Santa Clara River: These major waterways are prone to overflow during extreme storm events, particularly during El Niño years.
- Ballona Creek and Malibu Creek: These urban watersheds experience rapid runoff and flash flooding, especially in developed areas.
- Foothills, Valleys, and Recent Burn Scar Areas: Post-wildfire regions face heightened risk of flash floods and debris flows following storms.
- Antelope Valley: In desert regions, stormwater pools into temporary lakes, causing flooded roadways and infrastructure damage.

- Coastal Communities: Rising sea levels and storm surges threaten beachfront properties, harbors, and businesses.

Urban areas are particularly vulnerable due to impervious surfaces and outdated drainage systems. During intense storms, neighborhoods in Downtown Los Angeles, South LA, and the San Fernando Valley frequently experience street flooding and traffic disruptions, demonstrating the limitations of existing infrastructure in handling modern storm events.

For a better visual representation of this Flooding Hazard within the LA County planning area, please reference Appendix A for flood and inundation maps.

6.6.3 Extent

Los Angeles County faces a significant and evolving flood risk, with impacts ranging from localized urban inundation to widespread riverine flooding and destructive debris flows. Although the County has invested heavily in flood control infrastructure; including an extensive network of dams and debris basins; these systems are increasingly strained and cannot fully eliminate the threat. A growing number of residents are exposed to dangerous flooding each year, a situation made worse by the limitations of aging infrastructure and the complexities of urban hydrology. Intense rainfall events, especially those associated with atmospheric rivers, are occurring more frequently and with greater severity, often overwhelming drainage systems and resulting in severe flooding of streets and neighborhoods. Compounding this risk are burn scars from recent wildfires, which heighten the likelihood of mudslides and debris flows that threaten both life and property. As climate patterns shift and extreme weather events become more common, the flood vulnerability of Los Angeles County continues to deepen across its diverse geography.

Flood severity is typically measured using the 100-year and 500-year flood recurrence intervals, which indicate a 1% and 0.2% annual probability of flooding, respectively. These designations guide floodplain management and mitigation efforts.

Key Flood Hazard Statistics in Los Angeles County:

- 243.32 square miles (5.11%) of land have a 0.2% annual flood probability.
- 4.19 square miles (0.09%) have a 1% annual flood probability.

Key Flood Hazard Statistics for Unincorporated Los Angeles County:

- 64.77 square miles (2.13%) have a 0.2% flood probability.
- 1.23 square miles (0.04%) have a 1% flood probability.

As climate change accelerates sea-level rise and extreme rainfall events, these flood-prone areas may expand, affecting more residents, infrastructure, and businesses.

FLOOD IMPACT ON LAND AREA		
Area	**0.2% Annual Flood Probability**	**1% Annual Flood Probability**
Los Angeles County	243.32 sq. mi. (5.11%)	4.19 sq. mi. (0.09%)
Unincorporated LA County	64.77 sq. mi. (2.13%)	1.23 sq. mi. (0.04%)

6.6.4 History

Los Angeles County has experienced numerous severe flood events, many of which have caused catastrophic damage to infrastructure, property, and human life. Over the decades, climate variability, rapid urbanization, and an aging flood control system have led to repeated flooding disasters. There have been no federal declarations or state proclamations for earthquakes in the last five years.

Below are some of the most significant historical and recent flood events affecting the region.

Notable Flood and Lightning Events in Los Angeles County:

- **1938 Los Angeles Floods**: One of the deadliest floods in county history, caused by weeks of torrential rainfall, resulting in over 100 deaths, the destruction of thousands of homes, and widespread infrastructure damage, particularly to bridges and roadways.
- **1969 Winter Storms**: Heavy rains led to massive debris flows in the San Gabriel Mountains, severe urban flooding across Los Angeles, and multiple dam breaches, prompting major evacuations.
- **1992-1993 El Niño Floods**: A series of storms triggered landslides, flash flooding, and major coastal erosion, with significant damage to Pacific Coast Highway and residential areas.
- **2017 Winter Storms (DR-4305)**: Record-breaking rainfall led to significant urban flooding, road closures, and mudslides, with severe impacts across multiple communities.

- **October 2021**: Los Angeles County experienced a rare and intense thunderstorm with a significant amount of lightning.
- **September 2022 Hurricane Kay**: A pacific hurricane that caused significant rainfall along with risk of mudflows, coastal flooding, and coastal erosion.
- **January 2023 Atmospheric River Event (DR-4683)**: Heavy rainfall overwhelmed storm drains, causing significant flooding in Hollywood, Baldwin Hills, and low-lying inland areas, leading to evacuations and infrastructure damage.
- **February 2023 Los Angeles Floods (DR-4699)**: A series of intense storms caused widespread flash flooding, freeway closures, and landslides, demonstrating the increasing vulnerability of the county's urban areas to extreme precipitation events.
- **August 2023 Tropical Storm Hilary (DR-4750)**: Several locations in the mountains of Southern California received over 10 inches of rainfall which set daily and/or monthly rainfall records, in many locations in Southern California, including within Los Angeles County. It also created significant threat of flash and riverine flooding prompted the evacuation of numerous vulnerable communities near burn scars in the region.
- **December 2023 Pacific Storm**: Storm surges and extreme coastal flooding led to significant erosion along the coastline, particularly impacting Marina del Rey, Long Beach, and Venice Beach.
- **February - March 2024 Atmospheric River Storm (DR-4769)**: One of the most intense rainfall events in recent history, resulting in severe flash floods, mudslides, and power outages, with many homes and businesses sustaining flood damage.

6.6.5 Probability

Flood recurrence in Los Angeles County is influenced by both natural climate variability and the increasing effects of climate change. Historically, severe flooding is most likely during strong El Niño events, which occur approximately every 2 to 7 years and can persist for several months to multiple years. These events bring elevated precipitation levels and increase the likelihood of both inland and coastal flooding.

As climate change accelerates, the frequency and intensity of flood-generating events are expected to increase, altering traditional recurrence intervals and expanding the areas at risk. There is a 95% chance of a flooding event occurring each year withing Los Angeles County.

Key climate-related drivers include:

- **Sea-Level Rise**: Projected to rise by 6 inches to over 2 feet by 2050, increasing the risk of tidal and storm surge flooding in coastal communities.
- **Atmospheric River Events**: According to the 2024 THIRA, these events are becoming more frequent and intense, leading to elevated flash flood and debris flow risks.
- **El Niño Cycles**: Still expected every 2 to 7 years, but with increased variability and storm intensity that can overwhelm local drainage and flood control systems.

These evolving conditions challenge existing floodplain maps and design assumptions, highlighting the need for adaptive planning, updated risk models, and continued investment in resilient infrastructure and flood mitigation strategies.

6.6.6 Vulnerability

Los Angeles County faces widespread and layered vulnerabilities to flooding, shaped by a combination of environmental exposure and complex social factors. Physical vulnerability is pronounced in areas located within FEMA-designated Special Flood Hazard Areas (SFHAs), post-wildfire burn scars, and low-lying urban drainage basins that are prone to flooding. However, the degree of risk is significantly heightened for certain populations who may lack the resources or capacity to prepare for, respond to, and recover from flood events. Socially vulnerable groups, including older adults, individuals with disabilities or access and functional needs (AFN), mobile home residents, people experiencing homelessness, and low-income households; are more likely to reside in structurally vulnerable housing.

According to the 2021 Los Angeles County Comprehensive Floodplain Management Plan, more than a quarter of residents living within the 100-year floodplain earn less than $20,000 annually, underscoring the disproportionate economic burden faced by those least able to absorb the costs of recovery. Climate vulnerability data further demonstrates that marginalized communities in flood-exposed areas face elevated risks due to flooding events. The vulnerability landscape is further complicated by a shortage of affordable flood-resilient structures, and an increasing number of residents living in areas newly exposed due to climate-driven changes in precipitation and runoff patterns.

6.6.7 Impacts

Flooding in Los Angeles County leads to a broad range of direct and cascading impacts on people, infrastructure, environment, and the economy. The County's extensive network of critical facilities, including hospitals, fire stations, wastewater treatment plants, schools, and power substations. These areas face recurring exposure within both 100- and 500-year floodplains. Damage to these facilities not only compromises their physical integrity but also threatens their functionality during emergency response operations.

Flooding often disrupts lifeline services such as electricity, potable water, sanitation, and transportation, with rural and unincorporated areas facing the greatest challenges to rapid restoration. Mobile homes, frequently concentrated in low-lying or under-drained neighborhoods, are especially susceptible to flood damage due to construction limitations and inadequate protective measures. Previous flood events have resulted in significant debris flows, road closures, train stoppages, and damage to public and private structures.

Primary Vulnerabilities & Impacts:

- Over 1,470 structures are estimated to be damaged in a 100-year flood event, with total damages exceeding $769.7 million in property losses in unincorporated Los Angeles County.
- Additionally, more than 180 critical facilities are exposed in the 500-year floodplain, while 70 are within the 100-year floodplain, including transportation assets, utilities, emergency services, and hazardous materials facilities.
- A 100-year flood event could displace over a thousand people with many requiring sheltering, support and recovery efforts.
- Approximately 19,563 tons of building-related debris could be generated by a 100-year flood event, with clean-up requiring more than 780 truckloads, posing logistical, environmental, and public health challenges.
- 28.6% of households in the 100-year floodplain are economically disadvantaged, earning under $20,000 per year, limiting their ability to evacuate, recover, or pay for mitigation improvements.
- A large share of flood-prone properties are either uninsured or underinsured. The average flood insurance claim payout is $7,298, which is only about 1% of the 2019

average replacement cost of structures in the floodplain—indicating significant gaps in financial resilience.

- Wildfire burn scars and post-fire hydrophobic soils significantly increase flood and debris flow risks, particularly in foothill and canyon communities. This hazard continues to grow in severity with climate-driven fire seasons.

Estimated Damage to Critical Facilities in Unincorporated Areas from 100-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	1	7.56	10.24
Food, Water & Sheltering	9	6.72	18.73
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	0	N/A	N/A
Transportation	59	1.41	8.86
Hazardous Materials	0	N/A	N/A
Total/Average	**70**	**9.90**	**21.40**

Estimated Damage to Critical Facilities in Unincorporated Areas from 500-Year Flood

Sector	Number of Facilities Affected	Average % of Total Value Damaged	
		Structure	Content
Safety & Security	4	28.39	37.56
Food, Water & Sheltering	41	7.73	27.01
Health & Medical	0	N/A	N/A
Energy	1	23.90	47.79
Communications	2	5.00	16.00
Transportation	107	3.38	19.74
Hazardous Materials	30	10.00	15.00
Total/Average	**185**	**13.07**	**27.18**

Charts Source: LA County Public Works; 2021 County Comprehensive Flood Plan

6.6.8 Mitigation and Preparedness

Los Angeles County's flood mitigation strategy reduces hazard exposure, enhances community resilience, and supports long-term climate adaptation. Grounded in FEMA's National Mitigation Framework, CalOES planning guidance, and local policy, the County implements both structural and non-structural measures to address current and future flood risks. Core actions include regular maintenance and targeted upgrades to

stormwater infrastructure, restoration of floodplains, and integration of flood hazard data into land use planning. The County also prioritizes the protection of critical facilities and vulnerable housing through site retrofits, property acquisition, and elevation programs. Public outreach is conducted through a bilingual, ADA-accessible Program for Public Information, which promotes flood safety awareness, emergency preparedness, and participation in the National Flood Insurance Program (NFIP).

To ensure that mitigation is both data-driven and community-centered, the County utilizes climate projections and FEMA's HAZUS modeling to inform investments, while coordinating with regional partners to align local actions with broader watershed strategies. Key components of the approach include:

- Upgrading culverts, debris basins, and drainage systems to manage increased runoff
- Promoting low-impact development (LID) and incorporating green infrastructure in urban design
- Updating ordinances and the General Plan to discourage development in high-risk areas
- Maintaining inventories of repetitive loss areas and prioritizing resources for the most vulnerable populations

This comprehensive strategy ensures Los Angeles County not only meets federal and state standards but advances flood risk reduction in a way that safeguards people, property, and natural systems for the future.

6.6.9 Summary

Flooding is one of the most persistent and complex natural hazards in Los Angeles County, intensified by climate change, urbanization, and aging infrastructure. The Los Angeles County region experiences a range of flood types, including stormwater runoff, flash flooding, coastal inundation, and post-wildfire debris flows. These events are most common during winter storms and atmospheric river systems. High-density development, extensive paved surfaces, and fire-damaged hillsides contribute to rapid runoff and increased overall flood vulnerability. Areas along (but not limited to) the Los Angeles, San Gabriel, and Santa Clara Rivers, as well as coastal communities and foothill regions, are particularly at risk.

Los Angeles County's mitigation strategy is proactive and multifaceted. It includes infrastructure upgrades, nature-based solutions, land use policy updates, and public education. Core priorities focus on protecting critical facilities, reducing exposure in high-risk housing, and promoting community resilience. Planning efforts are supported by FEMA's HAZUS risk modeling and local climate projections. Despite progress, more than 750,000 residents remain at risk from major flood events, reinforcing the need for continued investment in comprehensive, flood risk reduction across the county.

6.6.10 National Flood Insurance Program (NFIP) Repetitive Loss (RL)

According to the Los Angeles County Public Works, there are 55 Repetitive Loss (RL) properties in 28 RL areas of Unincorporated Los Angeles County as of 2025, and 8 Severe Repetitive Loss Properties (SRLP). A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) in any rolling 10-year period since 1978. Updated location information about RL properties in Unincorporated Los Angeles County were not available during the drafting of this plan, but is being finalized and will be included in subsequent hazard mitigation efforts. Data from 2011 showed that 24 RL properties were located in the SFHA. At the time, the Los Angeles County Public Works stated, "the majority of the repetitive losses are associated with localized urban drainage flood problems, even for properties within a FEMA-designated flood zone." The Los Angeles County Public Works oversees RL mitigation projects.



6.7 Dam Failure

6.7.1 Nature

Dam failure refers to the structural collapse of a dam that results in the sudden and uncontrolled release of stored water. Such failures can occur due to age-related deterioration, inadequate spillway capacity, structural damage from seismic activity or flooding, and poor maintenance. The catastrophic release of water from a dam failure has the potential to cause human casualties, significant economic loss, and environmental destruction. This type of disaster is particularly dangerous because it can occur suddenly, leaving little time for evacuation or emergency response efforts.



The magnitude of flooding from dam failure often exceeds the capacity of downstream channels, causing rapid inundation of surrounding areas. This flooding can lead to extensive property damage, erosion, infrastructure destruction, and contamination of water supplies. Additionally, secondary hazards such as landslides and debris flows can be triggered, compounding the disaster's impact. The structural stress on dams may rise as dams age, and climate variability increases the frequency of extreme precipitation events. Planning efforts include both dams and debris basins. To simplify language of the plan both reservoir dams and storm water debris basins will be referred to as dams.

6.7.2 Location

Los Angeles County has over 90 dams regulated by the California Department of Water Resources' Division of Safety of Dams (DSOD). Fifteen (15) of these dams and eighteen (18) debris basins are owned and operated by the Los Angeles County Public Works (PW). In 2017, the California Legislature mandated that all state-jurisdictional dams (excluding those classified as Low Hazard) develop dam breach inundation maps and Emergency Action Plans (EAPs) approved by DSOD and Cal OES.

Many of these dams are located near highly populated areas, increasing the potential for human and economic impacts during a failure event. Seventy (70) dams are classified as High or Extremely High hazard potential dams, meaning their failure could result in significant loss of life and widespread property damage.

The Whittier Narrows Dam, reclassified as the U.S. Army Corps of Engineers' (USACE) highest-priority dam safety concern, poses one of the greatest risks due to its potential to flood highly populated areas from Pico Rivera to Long Beach. USACE has determined that an extreme storm event has a 1 in 900 (0.1%) chance of causing catastrophic failure annually. Mitigation actions related to County-owned dams are prioritized based on their hazard level and potential to impact populated areas.

For a better visual representation of this Dam Failure Hazard within the LA County planning area, please reference Appendix A for all the County owned dams and debris basins maps.

6.7.3 Extent

The Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, 2013) categorizes dam hazards into four classifications:

- **Low Hazard**: Minimal damage expected, no loss of life.
- **Significant Hazard**: Potential for property damage and economic disruption.
- **High Hazard**: Likely to result in loss of life and significant damage to critical infrastructure.
- **Extremely High Hazard (DSOD Classification)**: Could cause large-scale fatalities and inundate areas with over 1,000 residents.

Given the population density of Los Angeles County, a dam failure classified as High or Extremely High Hazard would likely cause substantial human casualties, displace entire communities, and inflict severe economic and environmental damage. Table 6-3 and 6-4 below shows a list of dams and debris basins owned by PW along with their hazard classifications. Potential mitigation actions described in this AHMP are only applicable to the dams and debris basins owned by PW and implementation of these actions are the responsibility of the PW Stormwater Engineering Division – Dams Section.

Table 6-3: Los Angeles County PW Dam Hazard Status

Dam Name	Hazard Status	Location
Big Dalton	Extremely High	Glendora, CA
Big Santa Anita	Extremely High	Monrovia, CA
Big Tujunga No. 1	Extremely High	Tujunga, CA
Cogswell	Extremely High	Azusa, CA
Devils Gate	Extremely High	LA Canada Flintridge, CA
Live Oak	Extremely High	La Verne, CA
Morris	Extremely High	Azusa, CA
Pacoima	Extremely High	Pacoima, CA
Puddingstone	Extremely High	San Dimas, CA
Puddingstone Diversion	High	La Verne, CA
San Dimas	Extremely High	La Verne, CA
San Gabriel No. 1	Extremely High	Azusa, CA
Sawpit	Extremely High	Monrovia, CA
Sierra Madre	High	Sierra Madre, CA
Thompson Creek	Extremely High	Claremont, CA

Table 6-4: Los Angeles County PW Debris Basin Hazard Status

Debris Basin Name	Hazard Status	Location
Bailey Debris Basin	High	Sierra Madre, CA
Big Dalton Debris Basin	High	Glendora, CA
Blanchard Debris Basin	High	Tujunga, CA
Brand Debris Basin	High	Glendale, CA
Eaton Wash Debris Basin	Extremely High	Pasadena, CA
La Tuna Debris Basin	Extremely High	Sun Valley, CA
Laguna Regulating Basin	Significant	Alhambra, CA
Little Dalton Debris Basin	Extremely High	Glendora, CA
Lower Sunset Debris Basin	High	Burbank, CA
Morgan Debris Basin	High	Glendora, CA
Rubio Debris Basin	High	Altadena, CA
Santa Anita Debris Basin	Low	Arcadia, CA
Sawpit Debris Basin	Extremely High	Monrovia, CA

Debris Basin Name	Hazard Status	Location
Schoolhouse Debris Basin	High	Los Angeles, CA
Sierra Madre Villa	Extremely High	Sierra Madre, CA
Stevenson Ranch	High	Stevenson Ranch, CA
Stough Debris Basin	Extremely High	Burbank, CA
Wilson Debris Basin	High	Los Angeles, CA

6.7.4 History

Los Angeles County has experienced one of the deadliest dam failures in U.S. history:

- St. Francis Dam Failure (March 12-13, 1928):
  - Released 12.4 billion gallons of water
  - At least 411 fatalities
  - Devastated towns from San Francisquito Canyon to Ventura County
  - Resulted in sweeping changes to California dam safety regulations and the creation of state oversight for civil engineers

While no major dam failures have occurred in recent decades, concerns over aging dam infrastructure, seismic risks, and increasing climate variability have raised alarms about future risks. Studies indicate that many California dams, including those in Los Angeles County, require structural updates to withstand modern hydrological conditions and potential seismic activity. There have been no federal declarations or state proclamations for dam failure in the last five years.

6.7.5 Dam Coordination

Los Angeles County Public Works coordinates with local, state, and federal agencies to mitigate flood risk hazards to downstream communities from its dams. At the local level, PW works with cities and public agencies during development of Emergency Action Plans (EAP). This provides local stakeholders with the opportunity to review the EAP, provide feedback, and confirm responsibilities and roles during an EAP activation. At request from local jurisdictions, PW may provide tours of its dam facilities, where information on dam safety and the potential hazards associated with dam failures are shared.

At the state level, PW works with the DSOD to meet compliance with state dam safety standards and flood management at all of PW's dams. This includes annual dam

inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, and oversight of other dam safety regulatory activities. PW also coordinates with various state agencies, including DSOD, Cal OES, and Caltrans during development of EAPs.

At the federal level, PW works with the Federal Energy Regulatory Commission (FERC) to meet compliance with state dam federal standards and flood management at PW's San Gabriel Dam, which is under FERC jurisdiction. This includes annual dam inspections, review, approval, and oversight of dam construction projects, review of dam safety monitoring, EAP coordination, and oversight of other dam safety regulatory activities. PW also coordinates with the United States Army Corps of Engineers (USACE) on operations of interconnected dam facilities and emergency response planning for USACE facilities that may be in the pathway of dam failure impacts.

Information Sharing

PW provides critical information to relevant local, state, and federal stakeholders to address hazard mitigation related to dam safety. This includes:

- **Emergency Action Plans (EAPs):** EAPs outline the roles, responsibilities, and procedures to follow in the event of a dam emergency. The EAPs include inundation maps, which show areas that would be affected by a dam failure, helping to identify populations at risk. These plans are shared with stakeholders to ensure a coordinated response. Due to the sensitive nature of information contained within the EAPs, they are confidential and not released to the general public.
- **Inundation Maps:** Inundation maps are critical tools for identifying areas and populations at risk in the event of a dam failure. They also indicate potential impacts on critical infrastructure facilities such as hospitals, schools, and transportation networks. These maps are shared with relevant stakeholders recognized in the EAP and are available to the general public through the DSOD Dam Breach Inundation Map Web Publisher.

6.7.6 Probability

Los Angeles County contains over 90 state-jurisdictional dams, with approximately 70 classified as High or Extremely High Hazard by the California Division of Safety of Dams (DSOD), meaning their failure could result in loss of life and significant property damage.

Although comprehensive failure probabilities are not published for each dam, FEMA and DSOD guidance suggest that the general annual probability of failure for High Hazard dams nationwide ranges from 0.01% to 0.1% (or 1 in 10,000 to 1 in 1,000) depending on maintenance, age, seismic vulnerability, and other site-specific factors.

Applying this range to Los Angeles County:

- The aggregate annual probability of a significant dam failure event in the county—across one or more of the 70 high-risk dams—is estimated at between 0.1% and 0.5% annually, factoring cumulative exposure and different hazard classifications. (Such as earthquake or flood related)
- Climate change, aging infrastructure, and seismic activity in Los Angeles County increase systemic risk across multiple structures simultaneously.

In summary, while the individual likelihood of failure for any one dam is very low, the overall countywide probability of at least one major dam failure event is low but still warrants continued vigilance, maintenance, and emergency planning.

6.7.7 Vulnerability

A catastrophic dam failure in Los Angeles County could have severe consequences for hundreds of thousands of residents. The densely populated nature of the county, combined with the location of several large dams near residential and commercial areas, increases the potential for widespread displacement, loss of life, and economic damage. The 2024 THIRA identifies multiple high-risk zones where dam failure could result in extensive flooding and mass evacuations.

- High-risk dams, among others, pose a significant threat to densely populated communities. A breach in any of these dams could inundate entire neighborhoods, affecting more than 500,000 residents in low-lying areas and floodplains.
- Socially vulnerable populations, including elderly individuals, the AFN community, people experiencing homelessness, low-income communities, and non-English-speaking residents face heightened risks during evacuations and recovery due to limited mobility, financial constraints, and access to resources.
- Educational and healthcare institutions are at risk, with several schools, hospitals, and long-term care facilities located in flood-prone areas. A major dam failure could result in school closures, displacement of students, and disruption of healthcare services.

- Evacuation and emergency sheltering demands would be substantial, requiring the rapid mobilization of resources to support displaced residents. Temporary shelters, emergency medical services, and logistical support would need to be activated to accommodate evacuees.

Los Angeles County relies heavily on dams and reservoirs for water storage, flood control, and supply regulation. Catastrophic dam failure poses an acute threat to life and property, especially in low-lying, highly populated downstream areas.

Extent of Exposure

- **Total Area Exposed**: 490.64 sq mi
- **Supervisorial Districts (SD) Impacted**:
    - **SD5**: 223.88 sq mi (7.97%)
    - **SD1**: 162.25 sq mi (45.98%)
    - **SD2**: 66.57 sq mi (18.32%)
    - **SD3**: 25.76 sq mi (5.97%)
    - **SD4**: 12.17 sq mi (5.72%)
- **Critical Facilities Affected**:
    - Fire Department: 112 (33.22%)
    - Public Works: 92 (40.00%)
    - Health Services: 29 (44.62%)
    - Public Health: 17 (42.50%)
    - Libraries: 30 (34.48%)
    - Parks: 65 (35.50%)
    - Education: 34 (41.46%)

Problem Statement

Dam failure, while rare, can have catastrophic consequences in densely populated downstream areas. With significant portions of critical infrastructure exposed—particularly in SD1 and SD5—planning for emergency evacuations, early warning systems, infrastructure hardening, and downstream development regulation is critical to saving lives and reducing loss.

A failure or breach of a High Hazard Potential Dam (HHPD) in Los Angeles County would result in catastrophic consequences for downstream communities, with the greatest vulnerabilities concentrated in densely populated urban areas. Rapid and massive flooding would likely inundate residential neighborhoods, commercial districts, and industrial zones within minutes to hours, depending on proximity and topography. Critical infrastructure—including hospitals, fire and police stations, schools, and major transportation corridors—would be severely impacted, disrupting emergency services and evacuation routes. Thousands of people, including vulnerable populations such as those with Access and Functional Needs (AFN), elderly residents, and low-income households, would face immediate life-threatening conditions, displacement, and limited access to medical care or shelter. Economic losses would be compounded by damage to utilities, including power substations and water systems, potentially leaving large swaths of the region without essential services. The sheer scale of devastation from a dam failure, especially at facilities such as Whittier Narrows or Castaic Dam, underscores the critical importance of continued risk reduction, early warning systems, and dam rehabilitation efforts.

6.7.8 Data Limitations

A limitation of this AHMP is that planning efforts only covered PW-owned dams in Los Angeles County. Future mitigation planning should include other dam owners and operators in Los Angeles County such as the US Army Corps of Engineers. The data on high-hazard dams reviewed during the 2025 AHMP planning process was generally suitable for the analysis required. Future opportunities for obtaining additional data to be considered in the next update to the plan should:

- Incorporate more current information as it becomes available.
- Assess any new or updated EAPs for dams owned by Los Angeles County.
- Identify and review more current structural or condition assessment data to inform future risk assessments.
- Involve other dam owners within Los Angeles County in future planning efforts.

6.7.9 Impacts

A dam failure in Los Angeles County would have catastrophic and immediate consequences for life, property, and critical infrastructure, particularly in the densely populated downstream areas. The sudden release of impounded water from a High or Extremely High Hazard dam could inundate neighborhoods within minutes, allowing little to no time for evacuation. More than 500,000 residents live within identified dam inundation zones, many of whom are in socially vulnerable populations—including

individuals with limited mobility, low-income households, and people experiencing homelessness–making rapid evacuation and sheltering especially challenging. County-owned high hazard potential dams and their locations are listed in Table 6-3. Inundation maps for County-owned high hazard potential dams are listed in Appendix A-7.

Critical infrastructure is also at significant risk. Hospitals, fire stations, law enforcement facilities, emergency operations centers, schools, and wastewater treatment plants located in downstream zones may be damaged or rendered inoperable, severely disrupting emergency response and life-sustaining services. Major transportation routes such as interstates, rail lines, and arterial roads could be submerged or washed out, impeding rescue and recovery efforts. Additionally, power substations, water distribution networks, and telecommunications infrastructure could suffer cascading failures, contributing to widespread outages and prolonged recovery periods.

The economic consequences of dam failure would be immense. Beyond property damage, business operations in inundated areas would halt, leading to loss of employment, tax revenue, and economic activity. Industrial zones (especially those near major flood control reservoirs or channels) could potentially release hazardous materials if overwhelmed, posing secondary environmental and public health hazards. Debris accumulation, sedimentation, and contamination could severely impact ecosystems, water quality, and flood control infrastructure downstream, complicating both emergency cleanup and long-term environmental recovery.

Given the scale of potential impacts, dam failure is considered a stable low-probability but high-consequence hazard in Los Angeles County, requiring continued investment in structural mitigation, emergency preparedness, and public awareness to reduce the severity of its effects.

6.7.10 High Hazard Potential Dams Goals

Goal 1: Enhance resilience across dam/debris basin infrastructure, including high-hazard potential dams, and other critical facilities within dam inundation zones.

Goal 2: Encourage structural reinforcement or retrofits for aging and vulnerable dams.

Goal 3: Ensure all dams/ debris basins have updated Emergency Action Plans (where applicable) and updated dam inundation mapping consistent with state standards.

6.7.11 Mitigation and Preparedness

Los Angeles County and state agencies have implemented various mitigation efforts to reduce the risks associated with dam failures:

- **Structural Reinforcements:** Upgrading spillways, strengthening earthen dams, and implementing seismic retrofitting measures.
- **Emergency Action Plans (EAPs):** Mandated by DSOD for all High and Extremely High hazard dams to guide evacuation and response efforts.
- **Early Warning Systems:** Improved flood monitoring and automated alert systems to notify at-risk communities in real-time.

6.7.12 High Hazard Potential Dam Prioritization

The risk assessment within the 2025 AHMP considers the county planning area's vulnerability and potential impacts related to HHPDs. Mitigation actions and planning efforts that are related to mitigating long-term vulnerabilities to County-owned HHPDs will automatically be given a HIGH priority as described in the overall mitigation action prioritization criteria in Section 7.6. The County Departments responsible for implementing the associated mitigation actions, along with the priority, potential funding source, and expected time frame are listed in Section 7.8.

6.7.13 Summary

Los Angeles County has 90 state-jurisdictional dams, with 70 classified as High or Extremely High hazard, meaning their failure could result in widespread loss of life and economic devastation. While regulatory oversight has improved dam safety, aging infrastructure, seismic threats, and increased storm intensity remain challenges. Continued investment in retrofits, early warning systems, and emergency planning is essential to mitigating the risk of catastrophic dam failures.



6.8 Land Movement

6.8.1 Nature

Land movement refers to the downward movement of rock, soil, or debris along a slope due to gravity. This process can occur suddenly or gradually over time, depending on contributing factors such as soil composition, slope stability, and external triggers. Land movement encompass a variety of movement types including mudflows, rockfalls, debris flows, land slumps, land subsidence, and soil movement. In Los Angeles County, the diverse topography and geological formations make certain areas more prone to land movement, particularly during periods of intense precipitation, seismic activity, or human land-use modifications.



Climate change exacerbates land movement by increasing the frequency and intensity of extreme weather events, such as heavy rainfall and flooding, which can lead to accelerated erosion and heightened landslide risks.

Land movement often occur in conjunction with other natural hazards, exacerbating their impact. Some of the primary contributing factors include:

- **Seismic Activity**: Earthquakes can destabilize slopes, leading to land movement and rockfalls. The force of seismic shaking can cause sudden failures, particularly in areas with pre-existing instability.
- **Heavy Rainfall and Flooding**: The likelihood of land movement increases after successive storms. Prolonged or intense rainfall saturates soil, reducing its cohesion and triggering slope failures.
- **Coastal Erosion**: Waves and storm surge erode coastal cliffs, leading to instability and eventual collapse, particularly in areas such as County beaches and coastal communities, many of which have previously experienced significant erosion.
- **Wildfires**: Loss of vegetation due to fires reduces the soil's ability to retain moisture, making slopes more susceptible to erosion and land movement during subsequent rain events.
- **Burn Scars**: Wildfire burn scars significantly elevate the risk of land movement by stripping the land of stabilizing vegetation. Areas affected by major fires such as the Woolsey Fire (2018), Bobcat Fire (2020), Bridge Fire (2024), Eaton Fire (2025), and Palisades Fire (2025) have shown increased susceptibility to land movement due to reduced soil stability and rapid runoff during rainstorms.

6.8.2 Location

Los Angeles County is home to multiple regions susceptible to land movement due to steep slopes, unstable geology, and weather patterns. The California Geological Survey (CGS) Landslide Susceptibility Map highlights high-risk areas. For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

Potential land movement areas include (but are not limited to):

- Santa Monica Mountains
- San Gabriel Mountains
- Sierra Pelona Mountains
- Baldwin Hills
- Puente Hills
- Palos Verdes Hills

These areas are particularly vulnerable due to their steep terrains, weak rock formations, and history of slope movement. Additionally, human activities such as grading, excavation, and construction in these regions can further destabilize the ground, increasing the likelihood of land movement. Areas impacted by past wildfires, known as burn scars, are also highly susceptible to land movement, as the loss of vegetation reduces soil stability and increases erosion risks during heavy rains. This is particularly concerning in wildfire-prone areas such as the Santa Monica Mountains and the foothills of the San Gabriel Mountains, where post-fire land movement have historically caused significant damage.

6.8.3 Extent

The extent of land movement in Los Angeles is significant and varied, influenced by its unique geological setting. According to the 2011 CGS Landslide Susceptibility Map, approximately 750 square miles (15.75%) of Los Angeles County fall within high-risk landslide zones. The highest concentrations of deep-seated landslide susceptibility are distributed as follows:

Table 6-5 Landslide Susceptibility Map

Area	High-Risk Landslide Zones (sq. miles)	Percentage of Total Land Area
Los Angeles County	750.02	15.75%
Unincorporated Areas	577.63	18.99%
Supervisorial District 1	17.29	7.02%
Supervisorial District 2	2.73	1.68%
Supervisorial District 3	114.61	26.58%
Supervisorial District 4	105.12	23.89%
Supervisorial District 5	509.31	18.14%

6.8.4 History

Land movement have historically caused significant damage in Los Angeles County, often resulting in property destruction, infrastructure damage, and road closures. There have been no federal declarations or state proclamations for dam failure in the last five years. Some of the most notable events include:

- **1956 – Portuguese Bend Landslide**: A massive landslide on the Palos Verdes Peninsula began in 1956 and remains active today. The movement of land has displaced homes and infrastructure, highlighting the region's ongoing geologic instability.
- **1994 – Northridge Earthquake-Induced Land movement**: The earthquake triggered more than 11,000 moving events, primarily in the Santa Susana Mountains and San Gabriel Mountains, causing extensive road and structural damage.
- **March 1995 – Pacific Palisades Landslide**: Heavy rains weakened the coastal bluffs, leading to a 300-foot-wide collapse that buried part of the Pacific Coast Highway under 30 feet of debris.
- **March 2005 – Sunset Mesa Landslide**: A slope failure near Malibu caused over 20,000 cubic yards of debris to block roadways and damage property.
- **July 2023 – Peartree Lane Land Movement (Rolling Hills Estates)**: A sudden slope failure resulted in the displacement of 12 homes, which were red-tagged due to structural instability.
- **September 2024 – Accelerated Land Movement in Rancho Palos Verdes**: A significant increase in land movement, with certain areas shifting up to four inches per week toward the ocean, threatening roads and over 250 residential properties.

6.8.5 Types of Land Movement

Debris Flow/ Mudflow/ Soil Movement

Debris flow involves the rapid movement of a dense mixture of water, soil, rock, and organic material down a slope. This process can have significant impacts on landscapes, ecosystems, and human infrastructure.

Debris flows are characterized by their fluid-like behavior and ability to transport large objects, such as boulders and trees. They can travel at high speeds making them highly destructive. The composition of a debris flow can vary, but it typically includes:

- **Water**: A crucial component that facilitates movement.
- **Soil and Rock**: These provide the bulk of the material in a debris flow.
- **Organic Material**: Includes vegetation and other natural debris that get caught in the flow.

Mudflows are rapid movements of water-saturated earth materials that can cause significant damage to both natural environments and human settlements. Mudflows are characterized by their fluid-like motion, which occurs when soil, rocks, and debris become saturated with water. This saturation reduces the friction between particles, allowing the mass to move downhill under the influence of gravity. Key characteristics include:

- **Speed and Volume:** Mud flows can travel at speeds up to 35 miles per hour and can carry large volumes of material, including rocks, trees, and even vehicles.
- **Consistency:** The consistency of a mud flow can vary from a thick, viscous slurry to a watery flow. This depends on the proportion of water to solid materials.
- **Path:** Mud flows typically follow existing drainage patterns, such as river channels and valleys, but can also carve new paths, leading to unpredictable and widespread damage.

Soil movement is a natural process that significantly impacts the environment and human activities. It involves the displacement of soil particles due to various natural and human caused factors. Key characteristics include:

- **Landslides:** Often occurring in hilly areas, landslides involve the downward movement of rock and soil. They can be sudden and fast-moving, making them particularly dangerous.
- **Soil Creep:** This is a slow and gradual movement of soil down a slope, often unnoticed until significant damage occurs.
- **Soil Liquefaction:** During an earthquake, saturated soil can temporarily lose its strength and behave like a liquid, causing structures to sink or tilt.

Causes

In Los Angeles County, several factors contribute to the occurrence of debris flows/mudflows/ soil movement:

- **Heavy Rainfall and Storm Events:** Intense and prolonged rainfall, often associated with storms, can saturate the soil, reducing its stability and triggering debris flows.

The region's Mediterranean climate, with wet winters and dry summers, creates conditions conducive to such events.

- **Wildfires:** Los Angeles County frequently experiences wildfires, which can burn and destabilize vegetation that normally helps hold soil in place. The loss of vegetation increases the risk of soil erosion and, consequently, debris flows during subsequent rainfalls.
- **Steep Terrain:** The county's mountainous terrain, including areas like County mountainous areas, is particularly prone to debris flow. The steep slopes facilitate the rapid movement of debris downhill.
- **Soil Composition:** Certain soil types, such as clay-rich soils, can become highly unstable when saturated with water, making them more susceptible to debris flow.
- **Human Activity:** Urban development, road construction, and deforestation can alter natural landscapes and exacerbate conditions that lead to debris flow.
- **Seismic Activity:** Los Angeles County is situated in a highly active seismic zone, making it prone to earthquakes. Seismic activity can lead to soil liquefaction, landslides, and ground shaking, all contributing to soil displacement.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to various natural and human-induced factors. This hazard can have significant impacts on the environment, infrastructure, and communities.

A reduction in land elevation is one of the most noticeable features of land subsidence, leading to significant changes in the landscape. This phenomenon can occur due to natural processes, such as the dissolution of limestone, as well as human activities like the excessive extraction of groundwater, oil, or natural gas. Furthermore, land subsidence increases the risk of flooding because the lower elevation can lead to poor drainage and water accumulation. As the ground sinks, it often results in the formation of depressions, fissures, and sinkholes, which can dramatically alter the geography and infrastructure of the area.

- **Depressions:** Are sunken or low-lying areas on the Earth’s surface, often formed by natural or man-made processes.
- **Fissures:** Are a long, narrow crack or linear opening in the Earth’s crust.
- **Sinkholes:** Are holes in the ground causes by the collapse or sinking of surface material into an underlying void.

Causes

- **Groundwater Extraction:** One of the primary causes of land subsidence in Los Angeles County is the excessive extraction of groundwater. As water is pumped out of underground aquifers, the ground above can sink or settle, leading to subsidence.
- **Oil and Gas Extraction:** The removal of oil and natural gas from beneath the earth's surface also contributes to land subsidence. This extraction can create voids and reduce pressure in subterranean layers, causing the ground to sink.
- **Natural Soil Compaction:** Over time, natural processes such as soil compaction can lead to gradual subsidence. In areas with loose or unconsolidated soils, the weight of overlying materials compacts the ground, resulting in a lowering of the land surface.

Rock Falls

Rock falls are a natural geological phenomenon where rock fragments break free from a steep slope or cliff and tumble downward. These events can range from small pebbles dislodging to massive boulders crashing down with significant force and impact.

Rock falls are characterized by:

- **Speed and Suddenness:** Rock falls occur quickly and without much warning, making them particularly dangerous.
- **Varied Sizes:** The size of the falling material can range from small pebbles to large boulders, impacting the severity of the event.
- **Path Predictability:** While the initial trigger point is often identifiable, the path of descent can be unpredictable due to varying terrain and obstacles.

Causes

The primary causes of rock falls include:

- **Weathering and Erosion:** Over time, weathering processes such as freeze-thaw cycles, chemical weathering, and the action of water can weaken rock structures. Erosion can undermine the base of slopes, making rocks more susceptible to falling.
- **Seismic Activity:** Los Angeles County is located in a seismically active region. Earthquakes can dislodge rocks from cliffs and steep slopes, triggering rock falls.

- **Heavy Rainfall:** Intense or prolonged rainfall can saturate the ground, increasing the weight and pressure on rock faces. This saturation can lead to the loosening and collapse of rocks.
- **Human Activity:** Construction, mining, and other human activities can destabilize rock formations. The vibrations from heavy machinery and blasting can initiate rock falls.

6.8.6 Probability

Landslides and other land movement events happen in Los Angeles County fairly often, especially after heavy rain or in areas that recently had wildfires or are prone to sliding.

- Small landslides (like debris flows) are most likely during years with heavy rain, especially El Niño years. These happen every 2 to 7 years; there is 14% to 50% chance each year during those cycles.
- In high-risk zones (like steep mountain slopes with a history of movement), probability is 1–2% chance per year, especially following multi-year wet periods or major wildfires.
- Some areas of the County have been experiencing continuous sliding.

6.8.7 Vulnerability

Land movement pose risks to life, property, and essential infrastructure. The 2024 THIRA projects that approximately 1.2 million residents in Los Angeles County could be directly or indirectly affected by land movement. The most at-risk populations include:

- Residents of hillside and canyon communities such as Malibu, Topanga, and the Palos Verdes Peninsula.
- Homeowners in coastal bluff areas that are facing erosion-driven slope failures.
- Communities in wildfire burn scar areas, where the loss of vegetation increases landslide probability during heavy rains.
- The Access and Functional Needs (AFN) community who may face challenges in evacuating or leaving landslide-prone areas.

Contextual Overview

Los Angeles County's diverse topography includes many hillside communities susceptible to deep-seated landslides, especially after wildfire or heavy rain. These hazards can isolate communities, damage property, and disrupt lifelines.

Extent of Exposure

- **Total Area Exposed**: 284.57 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD5**: 151.96 sq mi (5.41%)
  - **SD3**: 90.23 sq mi (20.93%)
  - **SD4**: 25.94 sq mi (12.20%)
  - **SD1**: 13.77 sq mi (3.90%)
  - **SD2**: 2.68 sq mi (0.74%)
- **Critical Facilities Affected**:
  - Fire Department: 41 (12.17%)
  - Public Works: 32 (13.91%)
  - Health Services: 12 (18.46%)
  - Public Health: 4 (10.00%)
  - Libraries: 9 (10.34%)
  - Parks: 27 (14.92%)
  - Education: 8 (9.76%)

Problem Statement

Landslides pose a serious risk to hillside communities and access routes, especially in areas recovering from wildfire. Current development and road infrastructure may not be resilient against slope failure. Mitigation actions should include slope stabilization, targeted buyouts or relocations, and early warning systems.

6.8.8 Impacts

Los Angeles County's diverse landscape and dense population make it highly susceptible to the effects of land movement, affecting critical infrastructure and raising significant economic, social, and safety concerns.

Transportation Networks

Los Angeles County's extensive transportation network is vital for daily commutes, goods transport, and emergency services. Land movement can severely impact these systems:

- **Road Damage**: Causes closures, hazardous driving conditions and costly repairs, as seen annually on Pacific Coast Highway (PCH), and many other local roads.
- **Bridge Compromise**: Affects structural integrity, necessitating closures and expensive reconstructions.
- **Public Transit Disruptions**: Impacts train tracks and bus routes, leading to delays and service interruptions.
- **Rail Systems:** Track misalignment can cause delays and potential derailments, affecting both passenger and freight lines.

Water Supply Systems

The county's water delivery system is complex and vulnerable to land movement:

- **Compromised Pipelines**: Leads to ruptures or leaks, disrupting supply and requiring major repairs.
- **Reservoir Impact**: Landslides can affect water quality and storage capacity.

Energy Infrastructure

Land movement poses risks to Los Angeles County's energy infrastructure, including:

- **Electrical Grid Vulnerabilities:** Land movement can damage power lines and substations, causing outages.
- **Gas Pipeline Risks:** Soil shifts can result in gas leaks or explosions, endangering safety.

Communication Systems

Reliable communication is critical, and land movement can disrupt:

- **Telecommunication Towers:** Structural damage can impair cellular and internet services.
- **Underground Cables:** Earth shifts can damage cables, affecting connectivity.

Emergency Services Facilities

- **Hospitals and Fire Stations:** Essential for emergency response, but structural damage could impede operations, underscoring the need for resilient construction and strategic planning.

Economic Impacts

- **Infrastructure Damage:** Leads to costly repairs and maintenance of roads, bridges, and buildings.
- **Property Loss:** Homeowners face financial losses due to property damage or devaluation.

Environmental Impacts

- **Ecosystem Disruption:** Soil movement can lead to habitat loss and affect local flora and fauna.
- **Increased Pollution:** Erosion can result in sediment runoff, degrading water quality in rivers and oceans.

For a better visual representation of the Land Movement Hazard within the LA County planning area, please reference Appendix A for maps that show areas that are susceptible to land movement and recent burn scars.

6.8.9 Mitigation Strategies

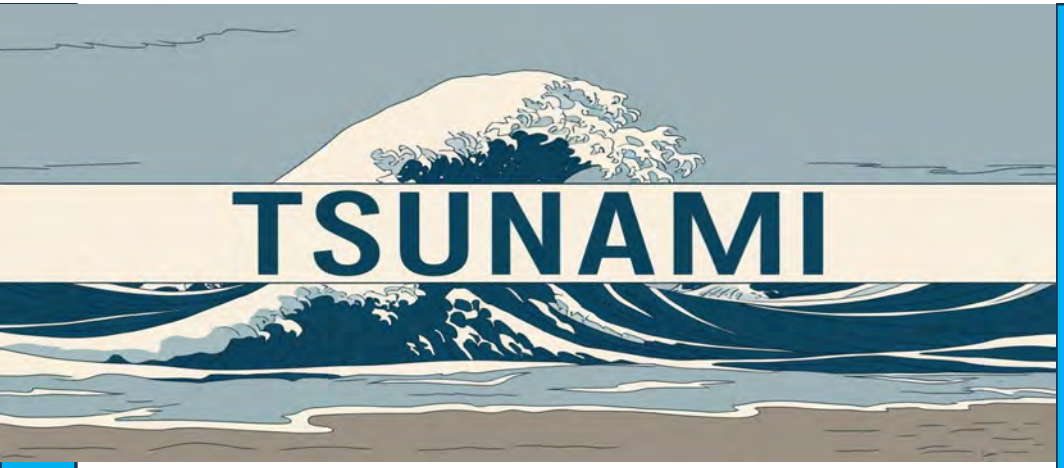
To reduce the impact of land movement, Los Angeles County has implemented several mitigation and preparedness strategies, including:

- **Land Use and Development Regulations:** Restricting development in high-risk landslide zones to prevent new structures from being built on unstable terrain.
- **Infrastructure Resilience:** Reinforcing existing infrastructure through slope stabilization projects, retaining walls, and improved drainage systems.

- **Stabilization Regulations:** Implementing stricter grading and excavation regulations to minimize the destabilization of slopes.
- **Public Awareness Campaigns:** Enhancing landslide early notifications by monitoring potential movement areas and precipitation thresholds.
- **Evacuation Planning:** Developing evacuation plans for at-risk communities, ensuring residents receive timely alerts and clear guidance.
- **Public Education:** Conducting public education campaigns to inform residents about recognizing landslide warning signs and preparedness measures.
- **Operational Area Coordination**: Increasing coordination across state, federal, and Office of Emergency Management officials with local jurisdictions to improve forecasting and response efforts.

6.8.10 Summary

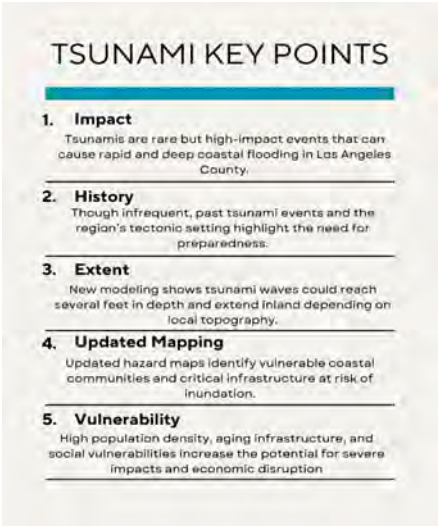
Land movement remains a significant hazard in Los Angeles County, particularly in steep and coastal regions. The Palos Verdes Peninsula, Santa Monica Mountains, and San Gabriel Mountains are among the most vulnerable areas, with climate change and human activities exacerbating risks. By implementing land-use regulations, infrastructure reinforcements, and emergency response improvements, the County can enhance resilience and reduce losses in the future. Local governments and communities must actively monitor and manage contributing factors to effectively mitigate the impacts of land subsidence.



6.9 Tsunami

6.9.1 Nature

This section characterizes tsunamis as high-energy, long-wavelength ocean waves generated primarily by significant offshore seismic events (such as subduction zone earthquakes), submarine landslides, or volcanic eruptions. In the context of Los Angeles County, tsunamis represent a relatively infrequent but potentially high-impact hazard that could produce rapid coastal inundation and surge impacts.



Characteristics:

- Triggered mainly by distant, large-magnitude seismic events.
- Features long wavelengths and prolonged arrival times.
- Capable of producing rapid, deep inundation along low-lying coastal areas.
- In summary, tsunamis are dynamic natural phenomena with the potential to cause sudden coastal flooding and damage if a triggering event occurs.

6.9.2 Location

The updated tsunami hazard profile focuses on the coastal areas of Los Angeles County. The new zone map—developed using enhanced modeling techniques and updated coastal geomorphology data—highlights areas along the Pacific shoreline that are at risk. These include regions adjacent to the Los Angeles Basin, parts of Long Beach, Santa Monica Bay, and other low-elevation coastal zones.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

Important Details:

- Coastal segments from the western margins of the Los Angeles Basin extending to the border with Orange County.

Overall, the coastal areas of Los Angeles County, containing our communities and infrastructure, face heightened exposure.

6.9.3 Extent

Using the latest hydrodynamic and inundation modeling, the updated tsunami inundation (zone) map provides a refined view of the extent of potential flooding. The map illustrates how tsunami waves could propagate inland, showing revised boundaries that account for current sea-level conditions and future sea-level rise projections.

Highlights:

- Inundation depths and reach have been recalculated, with some areas potentially experiencing water levels up to several feet in depth.
- The inland reach of flooding varies by local topography, with flat, low-lying areas showing the greatest potential for impacts. Impacted areas include, but are not limited to, Long Beach, The ports of Long Beach and Los Angeles, Marina del Rey, Venice and Santa Monica.
- Critical infrastructure within the updated zones has been identified to prioritize mitigation and evacuation routes for planning.

In essence, the extent of tsunami impacts is now mapped more precisely, offering local decision-makers a clearer view of potential flooding depths and distances inland.

6.9.4 History

Historically, significant tsunami events in the Los Angeles region are rare, though distant seismic events (for example: the 1960 Chilean tsunami, or the most recent 2022 Tonga tsunami) have been known to produce measurable impacts. Historical records combined with geological studies indicate that while tsunamis have occurred in the past, their frequency is low compared to other hazards. However, the region's proximity to major tectonic boundaries necessitates ongoing vigilance.

Historical Context:

- Past events have been sporadic but can serve as valuable lessons for preparedness.
- Historical inundation records and sediment studies confirm that tsunamis have reached the Los Angeles coast in prehistory.
- Lessons learned from past minor events underscore the importance of maintaining updated hazard maps.

Thus, while historical tsunami events are infrequent, they provide a critical context for understanding future risks and guiding preparedness measures. There have been no federal declarations or state proclamations for tsunami in the last five years.

6.9.5 Probability

The probability of a tsunami affecting Los Angeles County is generally low when compared to more frequent hazards like earthquakes or floods. Nevertheless, the potential for a distance source tsunami generated by a distant, large seismic event remains a realistic risk. Updated probabilistic assessments—incorporating recent seismic data and tsunami modeling indicate that while the overall likelihood is low, the consequences in the event of a tsunami can be severe.

Probability Considerations:

- Low annual probability but high consequence if an event occurs; Los Angeles County has about a 2% annual chance.
- Distance source events from subduction zones across the ocean contribute most to the risk.
- Continuous monitoring and updated modeling are essential to reassess the risk over time.
- In summary, the probability of a tsunami remains low, but due to the potential for high-impact outcomes, it warrants continuous study and preparedness.

6.9.6 Vulnerability

Coastal vulnerability in Los Angeles County is significantly influenced by factors such as urban density, low-elevation terrain, aging infrastructure, and socio-economic conditions. The updated tsunami zone map now better delineates areas where these vulnerabilities are most pronounced, highlighting communities that may have limited evacuation routes and fewer resources to recover from rapid inundation. About 75,000 people live in parts of Los Angeles County that could be flooded by a tsunami. Many people also work in these coastal areas, and around 660 unhoused individuals live there, making them especially at risk because they may not have easy access to shelter or transportation.

Tourism adds even more people to these areas, especially during busy weekends or holidays. Places like Santa Monica can see up to 300,000 visitors a day during peak times. This makes evacuating harder if a tsunami warning is issued. Roads near the coast can quickly become crowded, and visitors may not know the best way to leave. Traffic could slow down emergency plans, so it's important to have clear signs, early warnings, and good traffic control to help people get to safety quickly.

Factors:

- High population density in low-lying coastal areas.
- Critical infrastructure (e.g., hospitals, utilities, ports and shipping, transportation networks) located within the inundation zones.
- Socio-economic and language barriers that may hinder effective emergency response.
- Limited natural barriers in some coastal segments.
- Vulnerable communities include those with high population densities and critical infrastructure near the coast.

Ultimately, the vulnerability of the region is compounded by both physical exposures and social factors, underscoring the need for targeted mitigation efforts.

Contextual Overview

Coastal communities in Los Angeles County, including ports and tourist zones, are at risk from tsunamis. These rare but highly destructive events can inundate coastal infrastructure with little warning.

Extent of Exposure

- **Total Area Exposed**: 32.89 sq mi
- **Supervisorial Districts (SD) Impacted**:
  - **SD4**: 15.83 sq mi (7.43%)
  - **SD3**: 12.59 sq mi (2.92%)
  - **SD2**: 2.03 sq mi (0.56%)
- **Critical Facilities Affected**:
  - Fire Department: 16 (4.75%)
  - Public Works: 9 (3.91%)
  - Health Services: 3 (4.62%)
  - Public Health: 1 (2.50%)
  - Libraries: 5 (5.75%)
  - Parks: 13 (7.26%)
  - Education: 3 (3.66%)

Problem Statement

Tsunamis can cause rapid and catastrophic coastal flooding. With critical coastal infrastructure and residential areas exposed, especially in SD4 and SD3, there is a need for robust evacuation planning, vertical evacuation shelters, and community outreach to enhance preparedness and reduce vulnerability.

6.9.7 Impacts

Should a tsunami occur, the potential impacts on Los Angeles County could be extensive. Parts of Los Angeles County that could be impacted by a Tsunami are Marina Del Rey, Port of Los Angeles, Port of Long Beach, and other beach communities in low lying areas. The updated impact assessments reflect possible scenarios ranging from significant property damage to loss of life and long-term economic disruption. The new zone map aids in quantifying these impacts by providing detailed inundation depths and spatial extents, thereby allowing for better risk communication and planning.

Potential Impacts:

- Severe flooding of coastal infrastructure and residential areas.
- Disruption of transportation, utility services, and emergency response operations.
- Economic losses in key sectors such as tourism, shipping, and local commerce.
- Social impacts including displacement, loss of livelihoods, and challenges in emergency sheltering.

In short, the potential impacts of a tsunami are far-reaching, necessitating robust mitigation, evacuation, and recovery planning to minimize harm.

For a better visual representation of Tsunami Inundation zones within the LA County planning area, please reference Appendix A for a "Tsunami Inundation Area" map.

6.9.8 Summary

The updated tsunami section for the 2025 AHMP incorporates the latest scientific findings and mapping techniques to provide a more precise understanding of tsunami risks in Los Angeles County. By integrating an updated inundation zone map, the revision clarifies the spatial extent of potential flooding and highlights the vulnerabilities in coastal communities. This comprehensive update is designed to guide decision-makers in enhancing preparedness, targeting mitigation strategies, and strengthening community resilience.

Key Takeaways:

- **Nature:** Tsunamis are infrequent but high-energy events capable of rapid coastal inundation.
- **Location & Extent:** The updated zone map identifies vulnerable coastal areas with revised inland flood extents.
- **History & Probability:** Historical events are rare; however, distance events remain a realistic risk.
- **Vulnerability & Impacts:** High population density and critical infrastructure in coastal zones amplify risk, with potential for severe economic and social disruption.

This updated section is intended to serve as a critical tool for policymakers, emergency managers, and community stakeholders as they work together to reduce the long-term risks associated with tsunamis and enhance overall regional resilience.



6.10 Severe Wind and Tornado

6.10.1 Nature

Severe wind and tornadoes pose significant threats to life, property, and infrastructure, though they differ in frequency and intensity within Los Angeles County. Severe wind events, particularly Santa Ana winds, are a recurring natural hazard that can cause widespread damage, including downed power lines, tree falls, and structural damage. These winds originate from high-pressure systems over the Great Basin, funneling dry and warm air through mountain passes into the coastal and valley regions at high speeds. Additionally, storm-driven winds, microbursts, straight-line winds and gust fronts associated with severe weather can create hazardous conditions, often leading to transportation disruptions, fire hazards, and prolonged power outages.



Tornadoes, while relatively rare in the region, have been recorded and can cause localized but intense damage. These violent windstorms form when unstable atmospheric conditions produce rotating updrafts, resulting in a funnel cloud that contacts the ground.

6.10.2 Location

Severe wind events affect the entire Los Angeles County planning area, with the strongest occurrences in canyon passes, valleys, and coastal regions. The Santa Ana winds are most intense in the fall and winter months, particularly impacting areas in the Valley, and foothill communities of the County. Storm-driven winds, on the other hand, can impact any part of the county and vary in intensity based on weather patterns. These winds can reach speeds of 60 to 80 mph, sometimes exceeding those thresholds, leading to significant damage.

Tornadoes are more sporadic in occurrence and can develop in various parts of the county, particularly in lowland areas where severe thunderstorms have the potential to form rotating systems.

6.10.3 Extent

Winds and breezes are common occurrences in LA County. As wind speeds increase so does the potential for a catastrophic event. Hot dry winds can reach high speeds as they descend from the inland desert regions, creating not only critical wind events but also extremely dangerous fire conditions and contributing to the spread of wildfires. The winds are classified in the Beaufort Wind Scale, see Figure 6.10.1 below. Beaufort wind scale is an empirical scale that relates wind speed to observed conditions at sea or land. It uses numerical scale from 1-12 to describe wind force based on visual observations of the effects of the wind and gives quantitative measures of the wind. For example, o is described as 'calm' a sea like a mirror while 12 described as hurricane force with devastating conditions.

Tornadoes are classified using the Enhanced Fujita (EF) Scale Figure 6.10.2. The Enhanced Fujita (EF) Scale is specifically used to rate the intensity of tornados based on the damage they cause (damage indicators) such as building types, and trees. It ranges from EF-0 to EF-5, with increasing numbers indicate stronger tornados and more severe damage. While tornadoes in the region typically do not exceed EF-1

intensity, they can still produce damaging winds above 100 mph, capable of tearing roofs off buildings, uprooting trees, and overturning vehicles.

Beaufort Wind Scale:

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind

8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Figure 6.10.1 Beaufort Wind Scale

Enhanced Fujita Scale:

THE ENHANCED FUJITA SCALE (EF SCALE)		
EF RATING	**3 Second Gust (MPH)**	**DAMAGE**
EF 0	65-85 MPH	Light: Branches broken, minor roof damage
EF 1	86-110 MPH	Moderate: Roofs damaged; trees uprooted
EF 2	111-135 MPH	Considerable: Roofs torn off, large trees down
EF 3	136-165 MPH	Severe: Homes destroyed; cars lifted
EF 4	166-200 MPH	Devastating: Houses leveled; debris airborne
EF 5	Over 200 MPH	Incredible: Homes swept away; total destruction

Figure 6.10.2 Enhanced Fujita Scale

6.10.4 History

Los Angeles County has experienced multiple severe wind events and occasional tornadoes in recent history which caused destructions, and wildfires. There have been no federal declarations or state proclamations for Severe Wind & Tornadoes in the last five years. Some notable incidents include:

- **November-December 2011:** A wind event caused more than $35 million in damages and severely impacted several foothill communities and unincorporated areas.
- **December 2019:** An EF-0 tornado touched down in South Los Angeles, causing minor roof damage and downing power lines.
- **January 2021:** A severe windstorm impacted the region, leading to damage across multiple communities and emergency response efforts to clear roadways.
- **September 2021:** An EF-0 tornado developed near the community Lake of Los Angeles; %no damage was reported.

- **April 2023:** An EF-0 tornado recorded in Cerritos causing tree damage.
- **March 2023** (**DR# 4699):** An EF-1 tornado struck Montebello, one of the strongest tornadoes recorded in the area, causing significant damage to commercial structures and vehicles.
- **May 2023:** An EF-0 tornado occurred near the communities of Carson and Compton damaging buildings and vehicles.
- **August 2023 (DR# 4750):** Tropical Storm Hillary impacting Los Angeles County.
- **February 2024**: Strong winds impacting across Eastern Santa Monica Mountain and Santa Clarita Valley.
- **March 2024**: Strong winds impacting areas around San Gabriel Valley.
- **January 2025 (DR# 4856):** A severe windstorm impacted the region, leading to a Potentially Dangerous Situation (PDS), red flag conditions. Several fires broke out in the area, which exhibited extreme fire behavior, causing widespread destruction.
- **March 2025 (DR# 4856):** As part of a storm event, an EF-0 tornado struck Pico Rivera, California, at 3:15am, with wind speeds reaching up to 85 mph.

6.10.5 Probability

Severe wind events are a regular occurrence in Los Angeles County, with a high probability, 99% chance recurring annually. Santa Ana winds are particularly common during the cooler months, and climate patterns suggest that extreme wind events may become more frequent due to changing weather dynamics. Because wind events and tornados are localized in nature, probability vary from one area to another and is difficult to determine percentage of happening in one area. Tornadoes remain a low-probability hazard, 10% chance, in the planning area; however, given past occurrences, they cannot be ruled out entirely. Atmospheric conditions capable of producing tornadoes may arise during severe thunderstorms, particularly in winter storm systems that generate strong wind shear. While the likelihood of an EF-2 or stronger tornado is minimal, the potential for localized damage remains. The Santa Ana winds occur ten to twenty-five times annually and can last for several days, posing a recurring threat of damage and disruption in Los Angeles County.

6.10.6 Vulnerability

Severe wind and tornadoes can be extensive, affecting both infrastructure and public safety. High-wind events pose a risk to critical infrastructure, particularly power lines, communication systems, and transportation networks. Buildings, especially older structures and mobile homes, are vulnerable to wind-related damage, including roof failures, window breakage, and structural collapse.

In addition to physical damage, severe wind events can cause significant economic disruptions. Prolonged power outages impact businesses, healthcare facilities, and emergency response services. Road closures and debris blockages hinder mobility and commerce, while wind-driven wildfires, a secondary hazard of Santa Ana winds, can lead to devastating losses.

Public safety is also a major concern, with risks of flying debris, vehicle accidents, overturned vehicles, and respiratory issues caused by airborne dust and pollutants stirred up by high winds.

Severe wind and tornado events disproportionately impact certain populations and infrastructure in Los Angeles County due to both geographic exposure and socioeconomic vulnerabilities. These hazards can disrupt critical services, exacerbate existing inequalities, and significantly damage structures not built to withstand extreme wind conditions.

Vulnerable Populations

Out of the county's estimated 10.2 million residents, the following populations are considered especially vulnerable:

- Older Adults (65+): Approx. 1.6 million residents (15.5%)—more likely to suffer injury or health complications during wind-related power outages and evacuation events.
- Access and Functional Needs (AFN) Populations: Estimated 1.7 million individuals (17%) including those with disabilities, limited mobility, or communication barriers.
- Low-Income Households: Over 13% of households fall below the poverty line and may lack the resources for structural mitigation or relocation during prolonged outages.

- People Experiencing Homelessness (PEH): Over 75,000 individuals (2024 LAHSA count), at direct risk from falling debris and lack of shelter during windstorms.
- Mobile Home Residents: Approximately 98,000 units countywide, concentrated in inland valleys and foothill communities that are highly exposed to Santa Ana winds.
- Children Under Age 5: Around 600,000 countywide, vulnerable to respiratory complications from airborne particulates and debris stirred by strong winds.
- Economic Impact: Business disruptions, increased insurance claims, and the costs of emergency response and recovery add financial burdens to local communities.

Critical Infrastructure at Risk

Severe wind and tornado events can cause widespread cascading failures in vital systems, including:

- Power Infrastructure: Los Angeles County contains over 20,000 miles of overhead power lines vulnerable to high-wind damage and fire ignition.
- Medical Facilities: Over 350 licensed hospitals and health clinics, many reliant on uninterrupted power and access for vulnerable patient populations.
- Transportation Corridors: Major highways (I-5, I-10, US-101) and over 3,100 bridges, particularly in canyon and foothill areas, are susceptible to obstruction by fallen trees and debris.
- Communication Towers: Over 800 critical telecom sites serve the county's emergency communications and can be disrupted by high wind gusts.
- Schools: Approximately 2,300 public K–12 schools and 100+ college campuses face operational disruptions from power outages or infrastructure damage during events.

6.10.7 Impacts

Severe wind and tornado events pose significant threats to critical infrastructure, public safety, and community operations in Los Angeles County. High winds, such as those during Santa Ana events, regularly damage power lines, uproot trees, and disable

transportation corridors. A notable example occurred in January 2025, when widespread windstorms caused power outages for more than 200,000 customers, including approximately 127,000 Los Angeles Department of Water and Power (LADWP) customers and over 52,000 Southern California Edison (SCE) customers. During this same period, wildfires exacerbated by the strong winds impacted several medical facilities, disrupting critical health services and requiring the emergency relocation of patients.

Tornadoes, while rare, have also demonstrated destructive capacity in localized areas. In March 2025, an EF-0 tornado touched down in Pico Rivera, downing power lines and trees and obstructing roadways, highlighting the potential for tornadic activity to impact urban communities. These hazards not only endanger life and property but also threaten economic continuity and the functioning of emergency services, particularly in vulnerable neighborhoods and areas with aging infrastructure.

6.10.8 Mitigation and Preparedness

Efforts to mitigate the effects of severe wind and tornadoes should focus on improving structural resilience, enhancing early warnings and alerts, and increasing public awareness of such events.

Severe Wind and Tornado Mitigation

- Strengthening building codes to require wind-resistant design features. Promoting the use of wind-resistant materials and construction techniques in new developments.
- Conducting regular tree-trimming and vegetation management to reduce infrastructure damage risks.
- Retrofitting and reinforcing critical infrastructure, such as power lines and utility systems, to withstand high-wind conditions.
- Implementing public education campaigns on windstorm preparedness and safety measures.
- Leveraging early warning alerting and preparedness messaging, as well as integrating emergency messaging with local broadcast and mobile networks.

6.10.9 Summary

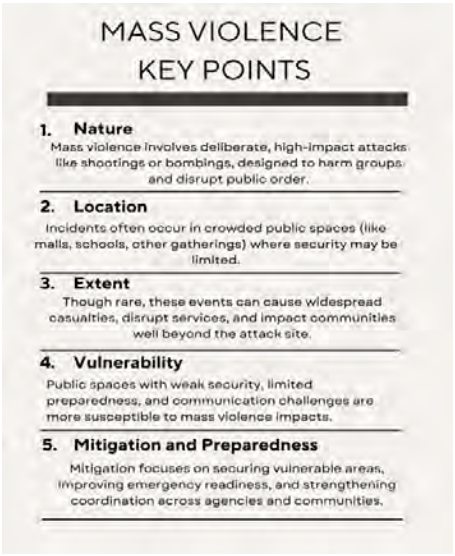
Severe wind and tornadoes, though differing in frequency, remain potential hazards for Los Angeles County. Santa Ana winds and storm-driven gusts regularly impact the region, causing damage to infrastructure and increasing wildfire risks. While tornadoes are rare, their occasional occurrence necessitates preparedness and mitigation efforts. By implementing stronger building codes, reinforcing critical infrastructure, and enhancing preparedness and public awareness, the county can reduce its vulnerability to these hazards, helps to better protect its residents from potential hazards of severe winds and tornado and improve community resilience.



6.11 Mass Violence

6.11.1 Nature

This section outlines the defining characteristics of mass violence, which includes intentional, high-impact incidents such as terrorism, active shooter events, vehicle-rammings, and other coordinated attacks. Understanding the nature of these events is critical for developing effective mitigation strategies.



- Mass violence includes both targeted attacks (e.g., ideologically motivated terrorism) and opportunistic acts (e.g., active shooters or violent assaults in public spaces).
- These incidents are characterized by their low warning time, high lethality, and potential to incite widespread fear and panic.

- Acts of mass violence may be perpetrated by individuals, small groups, or well-organized networks, and can involve firearms, explosives, vehicles, or biological agents.
- These attacks often aim to disrupt societal functions, damage infrastructure, or exploit vulnerabilities in soft targets such as schools, places of worship, or entertainment venues.

In summary, the nature of mass violence lies in its deliberate intent to inflict harm on groups and disrupt public order, making strong mitigation measures essential for protecting life and property of Los Angeles County.

6.11.2 Extent

The potential extent of mass violence is characterized by its ability to cause widespread disruption and significant loss of life and property.



- Events can result in many casualties and severe physical and psychological impacts.
- Mass violence can disrupt essential services, strain emergency response systems, and create cascading socioeconomic effects.
- The overall disruption may extend far beyond the immediate scene, affecting broader community resilience.

In essence, while these events may be rare, their extensive impacts necessitate comprehensive planning and resilient infrastructure.

6.11.3 History

Historical data illustrates that mass violence has evolved over time, with earlier events shaping current mitigation strategies and more recent incidents underscoring emerging vulnerabilities. Previous mitigation and other plans referenced events such as large-scale terrorist attacks and active shooter incidents.

- Recent events in the last five years include high-profile active shooter incidents at schools, public transportation hubs, and commercial centers, as well as vehicle-ramming attacks in urban areas.

Overall, the historical trend shows that while frequency remains low, the severity of mass violence incidents has escalated, necessitating continual updates to mitigation strategies.

6.11.4 Location

Mass violence incidents tend to occur in areas where people naturally congregate, including urban centers, transportation hubs, educational and religious institutions, shopping centers, and public events and venues.

- Public spaces such as transit stations, stadiums, malls and other locations where large number of people assemble, are considered higher-risk areas.
- Critical infrastructure location, like government buildings and commercial center, are often targeted.
- Certain events may also occur in areas lacking adequate physical security or surveillance.

Thus, identifying and securing high-density locations is a key focus for mitigating the effects of mass violence.

6.11.5 Probability

The probability of mass violence incidents is difficult to predict precisely; however, the potential for occurrence is recognized as a persistent low-frequency, high-impact risk that requires constant vigilance.

- Such incidents are statistically rare yet present a disproportionate risk due to their catastrophic consequences.
- Threat assessments and intelligence reports indicate that evolving tactics may increase probability over time.
- Continuous monitoring and updated threat analyses (e.g., via THIRA processes) are essential in quantifying risk levels.

In summary, while mass violence events are not common, their inherent unpredictability and high severity demand that communities prepare as if an incident could occur at any time.

6.11.6 Vulnerability

Mass violence depends on a variety of factors, including physical infrastructure design, public awareness, security preparedness, and interagency coordination.

- Critical vulnerabilities include open public spaces with minimal physical barriers or limited or ineffective safety / security protocols in place.
- Gaps in training and preparedness among first responders can exacerbate the situation during an active incident.
- Social vulnerabilities—such as communication gaps or lack of multilingual emergency information—may hinder rapid response and community resilience.

Thus, reducing vulnerability involves investing in infrastructure hardening, robust security measures, regular training exercises, and effective public communication strategies.

6.11.7 Impacts

The impacts of mass violence events are multifaceted, life safety, community stability, and the local economy.

- Immediate impacts include fatalities, injuries, and trauma among affected populations.
- Secondary impacts may encompass prolonged disruption of local services, economic downturns, and lasting psychological effects on communities.
- Long-term consequences can involve extensive resource allocation for recovery and mitigation, further straining public systems.

Mass violence inflicts immediate harm and often triggers a chain of secondary impacts that complicate community recovery and strain long-term resilience efforts.

6.11.8 Summary

In conclusion, mitigating the hazards of mass violence requires an integrated, multi-layered approach that spans prevention, preparedness, response and recovery. Communities must implement measures to secure high-risk locations, upgrade physical and digital security, enhance interagency coordination, and continuously update training and threat assessments.

- Mitigation strategies include physical security enhancements (e.g., barriers and surveillance), regular active shooter drills, improved emergency communication systems, and coordinated law enforcement and public health responses.
- Investment in resilience-building measures and community outreach helps to ensure that, in the event of an incident, communities can recover quickly and effectively.

This section underscores that while mass violence events are rare, their potential for high impact demands rigorous preparedness and adaptive mitigation strategies to safeguard lives and maintain community functionality.



6.12 Cybersecurity Incidents

6.12.1 Nature



Cybersecurity incidents refer to disruptive events affecting digital networks and systems. These events involve the unauthorized electronic or physical access of information systems that jeopardizes or disrupts the integrity, confidentiality, or availability of information. Cyber incidents can range from minor targeted data breaches to large-scale ransomware attacks and distributed denial-of-service (DDoS) events that compromise critical infrastructure. Common types of cybersecurity incidents include, but are not limited to:

- **Data Breaches:** The compromise, unauthorized disclosure, or unauthorized acquisition of information.

- **Malware:** Malicious hardware, firmware, or software that is intentionally included or inserted in a system for a harmful purpose.
- **Ransomware:** A type of malicious software designed to lock access to a system until a ransom payment is received. Note that ransom payment is not a guarantee that system access will be restored by the threat actor.
- **Denial of Service (DoS):** An attack meant to shut down a machine or network, rendering it inaccessible to its intended users.
- **Distributed Denial of Service (DDos):** A DoS attack that uses numerous hosts to perform the attack.
- **Insider Threats:** When an insider (e.g., an employee or vendor) uses their authorized access, wittingly or unwittingly, to do harm to an organization.
- **Phishing Attacks:** The fraudulent practice of sending emails purporting to be from reputable senders in order to induce individuals to reveal information or download malware by clicking on a link.

Key characteristics of a cybersecurity incident include:

Rapid Onset: Impacts to operations can occur suddenly and evolve quickly.

- **Sophistication:** Can be highly sophisticated with state or non-state actors involved.
- **Hybrid Attacks:** May involve both cyber and physical components due to interdependencies.
- **Non-Malicious Incidents:** Technological failures that cause similar impacts to cybersecurity incidents may also occur due to non-malicious reasons such as a software or hardware issue.

Understanding the inherent digital nature and complex characteristics of these incidents is critical to developing effective prevention and mitigation strategies.

6.12.2 Location

Unlike traditional hazards that have a physical geographic footprint, cybersecurity incidents are inherently transboundary. However, their effects manifest locally through the disruption of critical services and systems and necessitate regionally coordinated preparedness and response efforts.

Jurisdictional Relevance:

- Impact local government networks and county infrastructure.
- Affect public and private sector systems within Los Angeles County.
- Disrupt critical infrastructure such as utilities and cause cascading impacts.
- Involve cyber nodes that, while globally distributed, converge on regional networks.

Critical Sectors Impacted:

- Hospitals and healthcare facilities.
- Financial, banking, or payroll systems.
- Transportation providers and systems.
- Utilities such as electricity, gas, and water.
- Emergency response and public safety agencies.

6.12.3 Extent

The extent of cybersecurity incidents is measured not only by the volume of compromised data or financial loss but also by the potential disruption to essential services and critical infrastructure.

Scope of Impacts:

- Rapid spread across interconnected digital systems.
- Potential for cascading failures that disrupt multiple sectors.
- Economic losses that may run into millions of dollars.

Measurable Factors:

- Number of systems compromised.
- Downtime of critical infrastructure and services.
- Financial costs from remediation and lost productivity.

The extensive reach of cybersecurity incidents—both in terms of economic impact and service disruption—highlights the need for robust digital defenses, continuity of operations planning, backup systems and redundancies, disaster recovery strategies, and regional cyber response coordination.

6.12.4 History

Historically, cybersecurity incidents have evolved from isolated breaches to coordinated attacks that leverage global networks. Early cybersecurity incidents focused on data theft and vandalism. More recent attacks have grown increasingly sophisticated and targeted critical infrastructure or use complex ransomware. Cyber threat actors include state-sponsored groups along with non-state groups such as criminal enterprises and terrorist organizations. Recent years have seen cybersecurity incidents affecting large corporations, public entities including local governments, and critical infrastructure sectors. Previous major cybersecurity incidents have included:

- **2024 Los Angeles County Superior Court Ransomware Attack:** Resulted in the shutdown of nearly every court system, a multi-day closure of the court, and cascading impacts to operations.
- **2024 Hospital Group Attack:** A major hospital company experienced an attack that caused IT and phone system outages and disrupted patient care at several Los Angeles County hospitals.
- **2024 Telecommunication Industry Attacks**: A series of attacks against telecommunications providers in the United States resulted in compromised customer data.
- **2023 City Attack:** A cybersecurity incident at a city within Los Angeles County caused city IT systems to be taken offline.
- **2022 Aviation Industry Attacks:** A series of cybersecurity incidents targeting the airports and airlines caused transportation system disruptions.

The historical progression from rudimentary attacks to highly coordinated cybersecurity incidents underscores the growing importance of proactive risk management in the digital realm.

6.12.5 Probability

The probability of cybersecurity incidents occurring is increasing as digital interconnectivity expands and as attackers continue to innovate their methods.

Risk Trends:

- Rapid expansion of the Internet of Things (IoT), the network of internet-connected devices ranging from smart refrigerators to autonomous vehicles, has added new attack vectors to the threat landscape.
- Increasing sophistication of cybercriminal methods including zero-day exploits, a previously unknown cybersecurity vulnerability.
- Growing frequency of reported incidents nationally and globally.

Contributing Factors:

- Inadequate cybersecurity measures in legacy systems still being used by organizations.
- Underinvestment in cyber defense infrastructure or cybersecurity expertise.
- Greater digital reliance in everyday operations without proper continuity of operations planning.

Given current trends and technological developments, the likelihood of cybersecurity incidents remains high, necessitating ongoing vigilance and enhanced preparedness measures. As cybersecurity incidents continue to increase in frequency, the potential for an incident to cause cascading and widespread impacts to critical infrastructure increases as well.

6.12.6 Vulnerability

Vulnerability in the context of cybersecurity refers to the susceptibility of digital systems to attack. This is influenced by both technological and organizational factors including, but not limited to: outdated software or use of legacy systems, insufficient patch management, inadequate segmentation and defense-in-depth strategies, and lack of cybersecurity training among personnel. Organizational challenges also contribute to cybersecurity vulnerability including, but not limited to: budget constraints, gaps in coordination, and rapid technology adoption without corresponding security protocols.

According to the 2024 Threat and Hazard Identification and Risk Assessment (THIRA), over 616,000 people may be affected by a large-scale cybersecurity incident with cascading impacts to utilities. Over 123,000 of those impacted in the THIRA scenario are estimated to have access and functional needs and over 77,000 people are

estimated to have limited English proficiency. Depending on the utilities affected by the incident, a widespread amount of the population could be without utility service for an extended period. Addressing these vulnerabilities is essential to reduce the risk and potential disruption of cybersecurity incidents, calling for both technical upgrades and improved interagency coordination.

6.12.7 Impacts

The impacts of cybersecurity incidents are multifaceted, affecting economic stability, public safety, and critical infrastructure operations.

Direct Impacts:

- Disruption of critical services (e.g., healthcare, emergency response, transportation, etc.).
- Extended duration Continuity of Government or Continuity of Operations event.
- Financial losses due to ransom payments, remediation costs, and potential legal fees.
- Loss, compromise, or unauthorized release of sensitive data.

Indirect impacts:

- Erosion of public trust in digital services and affected institutions.
- Cascading effects on physical infrastructure (e.g., power grid, water systems, wastewater, etc.).
- Long-term economic repercussions from reduced competitiveness.
- The significant impacts—both direct and cascading—of cybersecurity incidents necessitate comprehensive mitigation and recovery strategies that address both technical and socioeconomic dimensions.

6.12.8 Summary

In summary, cybersecurity incidents represent an evolving and critical threat that intersects with multiple aspects of community resilience and safety.

Key Takeaways:

- Cyber incidents are dynamic, sophisticated, and far-reaching in impact
- They affect local systems despite their global nature

- Historical trends and increasing digital dependency heighten both probability and vulnerability
- Impacts extend beyond financial loss to include service disruption and cascading infrastructure failures

Cybersecurity incidents demand a proactive, coordinated response that integrates robust technical defenses with cross-sector planning and recovery efforts. By understanding the nature, scope, and potential consequences of these incidents, communities can build more resilient digital and physical infrastructures to safeguard against this growing threat.



6.13 Transportation Incidents

6.13.1 Nature

This section describes the inherent characteristics of transportation incidents that can disrupt the continuous flow of people, goods, and emergency services across Los Angeles County. Transportation incidents can be triggered by a variety of factors including natural events, human error, and deliberate acts. Other characteristics include:

- **Affected Modes of Transportation:** Incidents can involve any mode of transportation such as multi-vehicle collisions, hazardous material spills, rail derailments, aviation incidents, and maritime disruptions.
- **Cascading Impacts:** Disruptions to the transportation system often have the potential to trigger cascading failures due to the interconnected design of highways, rail networks, airports, and seaports.
- **Contributing Factors:** Incidents may be influenced by both predictable factors (e.g., rush-hour congestion) and unpredictable occurrences (e.g., extreme weather or infrastructure failure).

6.13.2 Location

The county's network encompasses highways, rail, airports, ports, and local roads that are critical to regional mobility and commerce.

- **Freeways:** Los Angeles County boasts an extensive freeway system with over 1,200 miles of high-capacity roads including corridors such as I-5, I-405, I-10, I-710, and I-210.
- **Major Transportation Hubs:** The County is home to three commercial airports including Los Angeles International Airport (LAX), Long Beach Municipal Airport (LGB), and the Hollywood Burbank Airport (BUR) along with several general aviation airports. The County owns and operates Brackett Field Airport, Compton/Woodley Airport, San Gabriel Valley Airport, General William J. Fox Airfield, and Whiteman Airport. The Ports of Los Angeles and Long Beach, which are two of the busiest ports in the United States and vital for national and international trade, are also in Los Angeles County. Additionally, Los Angeles Union Station serves as the largest passenger rail station on the west coast.
- **Other Transportation Networks:** The county includes robust passenger rail, bus, and paratransit systems, along with freight rail systems, emerging mobility options such as taxis and rideshare services, and enhanced bicycle networks. This comprehensive network is the backbone for daily commuting, freight movement, and emergency response across the region.

6.13.3 Extent

The scope of transportation incidents spans multiple modes of travel and can have widespread consequences across the county's integrated infrastructure. Road incidents may include multi-vehicle collisions, hazardous material spills, and roadway fires impacting multiple vehicles with potential delays in emergency responses.

- Rail disruptions can impede commuter and freight services, impacting both local transit and regional connectivity.
- Air and maritime incidents—such as delays at major airports or disruptions at port facilities—can significantly affect commerce, supply chains, and public safety.
- Cascading effects across interconnected transportation modes may exacerbate congestion and strain additional infrastructure systems such as power, water, and emergency communications.

The extensive and interdependent nature of these networks means that an incident in one area can quickly influence multiple transportation systems.

6.13.4 History

Los Angeles County has a long record of transportation-related incidents that have disrupted mobility and commerce.

- **2024 Vincent Thomas Bridge Fire:** A semi-truck carrying lithium-ion batteries overturned and caught fire, causing the bridge to be closed for several days.
- **2023 I-10 Freeway Fire:** A fire in a pallet yard below the I-10 freeway in Downtown Los Angeles caused an eight-day closure for repairs and major cascading disruptions.
- **2020 Delta Air Lines Flight 89 Fuel Drop:** Shortly after takeoff from LAX, a Boeing 777 encountered engine problems and conducted a fuel dump over populated areas, injuring over 50 people on the ground.
- **2008 Chatsworth Metrolink Derailment:** A Metrolink passenger train collided with a Union Pacific freight train injuring over 130 people and causing 25 deaths.
- **2007 Newhall Pass Tunnel Fire:** A multi-vehicle collision involving over 30 vehicles caused a fire within the tunnel injuring 10 people and causing 3 deaths.

The historical record reinforces the need to learn from previous events to enhance future preparedness and resilience.

6.13.5 Probability

The likelihood of transportation incidents in Los Angeles County remains elevated due to several converging factors including, but not limited to:

- High daily traffic volumes on freeways and arterials increase the risk of multi-vehicle accidents and congestion-related incidents.
- Aging infrastructure—including bridges, road surfaces, and rail systems—creates a persistent risk of failure, particularly under extreme weather conditions and during peak usage periods.
- The county's role as a major hub for freight and commuter traffic means that even minor incidents can escalate rapidly into larger disruptions.
- The frequent movement of hazardous materials and the increasing reliance on just-in-time delivery systems further elevate the risk of incidents with potentially severe consequences.

Together, these factors contribute to a consistently high probability of transportation incidents impacting the region.

6.13.6 Vulnerability

The vulnerability of Los Angeles County's transportation system is compounded by its interdependent design and its critical role in the regional economy.

- Limited redundancy in key corridors means that a disruption on one freeway or rail line can quickly overload alternate routes.
- Aging and overburdened infrastructure is less resilient to extreme events, leading to longer recovery times after incidents.
- The county's economic dependence on uninterrupted transportation for daily commuting and commercial freight increases exposure to significant losses during disruptions.
- Complex interdependencies between transportation systems, emergency services, and other critical sectors make the network highly sensitive to cascading failures.

This systemic vulnerability calls for coordinated, multi-agency efforts to bolster resilience and implement proactive mitigation measures.

6.13.7 Impacts

Transportation incidents can produce both immediate and long-lasting effects on public safety, commerce, and overall quality of life.

1. **Traffic and Mobility:** Disruptions can lead to severe congestion affecting hundreds of thousands of commuters and freight vehicles, delaying emergency services and disrupting daily operations.
2. **Economic Loss:** Interruptions in the movement of goods and people can result in substantial financial losses, impacting local businesses and the broader regional economy.
3. **Public Safety:** Extended delays in emergency response and Emergency Medical Services (EMS) transport times.
4. **Cascading Disruptions:** An incident in one mode (e.g., a major highway closure) can ripple through the transportation network, affecting rail, air, and maritime operations simultaneously and complicating recovery efforts.

These impacts highlight the critical need for robust mitigation strategies to manage both direct and indirect consequences of transportation incidents.

6.13.8 Summary

Los Angeles County's transportation network is among the most extensive and complex in the nation, serving millions of residents and underpinning a vital economic ecosystem. The diverse transportation modes, while facilitating mobility and commerce, also create vulnerabilities due to overlapping infrastructure and high traffic volumes.

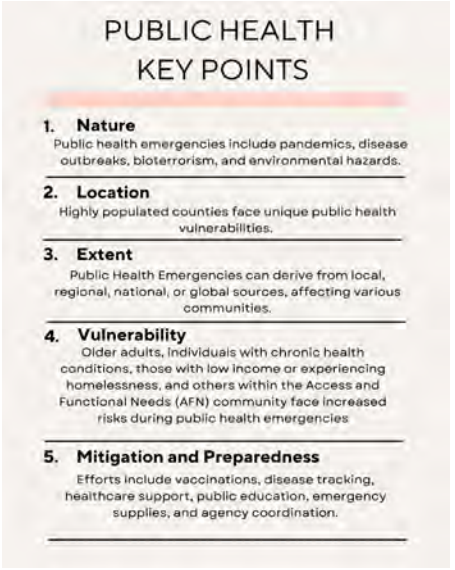
- Aging infrastructure, coupled with the continuous movement of hazardous materials and the increasing pressures of daily usage, contributes to a high probability of incidents.
- Historical data demonstrate that even localized incidents can have far-reaching impacts, including prolonged traffic congestion, economic disruptions, and public safety challenges.

In conclusion, mitigating transportation incident risks in Los Angeles County requires an integrated, countywide approach that combines infrastructure upgrades, enhanced emergency response, and proactive maintenance strategies. Addressing these challenges is essential to safeguard public safety, ensure economic stability, and maintain the region's critical mobility infrastructure.



6.14 Public Health Emergencies

6.14.1 Nature



Public health emergencies in Los Angeles County encompass a broad spectrum of potential hazards, including infectious disease outbreaks, environmental health hazards, and Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) hazards. Given the county's diverse population, urban density, and economic significance, public health hazards require a coordinated response among government agencies, healthcare institutions, and community partners.

Public health emergencies refer to incidents that pose a significant threat to the health of a population. These include, but are not limited to:

- Pandemics (e.g., COVID-19, Influenza)
- Bioterrorism (e.g., Anthrax, Smallpox, botulism)

- Vector-borne diseases (e.g., West Nile Virus, Zika)
- Foodborne and waterborne illnesses
- Chemical and radiological exposure
- Climate-related health threats (e.g., extreme heat, poor air quality, wildfires)

The County of Los Angeles Department of Public Health (DPH) and the Emergency Medical Services Agency (EMS) collaborate to monitor threats, prevent outbreaks, and mitigate impacts when emergencies arise.

6.14.2 Location and Extent

Los Angeles County, home to over 9.7 million residents, is the most populous county in the United States. Its diverse geography (i.e., urban, coastal, mountainous, and rural) and demography lead to a range of public health vulnerabilities.

Public health emergencies can originate from local, regional, national, or global sources, impacting specific neighborhoods or the entire county. The extent of public health threats varies based on:

- The nature of the threat, such as transmission dynamics or availability of medical countermeasures.
- Population density (higher risks in urban centers for communicable diseases)
- Access to healthcare infrastructure
- Environmental conditions (air pollution, extreme heat events)

6.14.3 History

Public health emergencies in Los Angeles County have included:

- 2022 Monkeypox Outbreak
  - Approximately 2,500 cases were reported in Los Angeles County.
- COVID-19 Pandemic (2020–Present)
  - Over 3 million cases, 450,000 hospitalizations, and 45,000 deaths reported in the county alone.
- 2018 Hepatitis A Outbreak
  - Primarily affecting unhoused populations, requiring mass vaccination efforts.
- 2016-2017 West Nile Virus Outbreaks
  - Multiple cases of mosquito-borne infections leading to severe illness and fatalities.

- 2015-2016 Zika Virus Outbreak
  - No cases of local mosquito-borne transmission, but there were 122 cases reported in the County, with 121 being travel-related.
- 2015 Meningococcal Disease Cluster
  - An outbreak among men who have sex with men (MSM) led to a targeted vaccination campaign.
- 2009 H1N1 Influenza Pandemic
  - Thousands of hospitalizations; schools and businesses affected.

6.14.4 Probability and Emerging Risks

The 2024 Threat and Hazard Identification and Risk Assessment (THIRA) identifies that pandemics and bioterrorism remain high-probability threats. Future public health risks also include:

- Emergence of infectious diseases driven by global travel and climate change.
- Increased incidence of heat-related illnesses amid rising temperatures.
- Increased prevalence of respiratory diseases due to declining air quality.
- Rise of antimicrobial-resistant infections due to overuse of antibiotics.

The County of Los Angeles DPH continually assesses health threats and updates preparedness plans to address evolving concerns.

6.14.5 Vulnerability and Systemic Impacts

Certain populations in Los Angeles County may be disproportionately affected by public health emergencies:

- At-risk populations may be different for different hazards before, during, and after an emergency. It is important to assess each hazard in turn to identify those who may be disproportionately affected to improve preparedness and response efforts.

Public health emergencies strain the healthcare system, disrupt economic activity, and create mental health burdens. The 2024 THIRA report noted that:

- Healthcare infrastructure overload is a major concern during pandemics.
- Potential economic loss from business closures during a prolonged public health crisis could exceed billions of dollars.

6.14.6 Mitigation Strategies and Preparedness Efforts

Los Angeles County employs several mitigation and preparedness strategies:

- Mass Vaccination Campaigns
  - Annual flu shots, COVID-19 vaccinations, and outbreak-specific immunization efforts.
- Points-of-Dispensing (POD) sites
  - Disease Surveillance & Early Warning Systems
- Syndromic surveillance for emerging threats.
  - Targeted sampling surveillance.
- Healthcare Infrastructure Strengthening
  - Expanding hospital capacity for medical surge, and emergency medical resources.
- Community Outreach & Public Health Education
  - Disseminating critical information in multiple languages.
- Emergency Stockpiles (Strategic National Stockpile(SNS))
  - Deployment of antibiotics, antivirals, and personal protective equipment (PPE) in crisis situations.
- Coordination with Federal & State Agencies
  - Collaboration with FEMA, CDC, and the California Department of Public Health to enhance response capabilities.
- Anthrax Threat Simulations
  - The County of Los Angeles Metro system assessed as a high-risk area for bioterrorism response.

6.14.7 Summary

Public health emergencies pose significant challenges to Los Angeles County, impacting healthcare systems, vulnerable populations, and economic stability. While the COVID-19 pandemic provided a major stress test for response efforts, ongoing preparedness, surveillance, and mitigation strategies aim to protect residents from future threats.

Key Takeaways:

- Los Angeles County faces diverse health threats, including pandemics, bioterrorism, and climate-related illnesses.

- Vulnerable populations may suffer disproportionate impacts during public health crises.
- Preparedness efforts focus on surveillance, vaccination, emergency response, and coordination with federal and state partners.
- Future threats include emerging infectious diseases, heat-related illnesses, and antimicrobial resistance.

By continuing investments in public health preparedness, Los Angeles County aims to reduce risks and strengthen resilience against future health emergencies.

7 Mitigation Strategy

7.1 Mitigation Strategy Overview

The Mitigation Strategy section of the All-Hazard Mitigation Plan (AHMP) presents Los Angeles County's strategic blueprint for reducing risks and vulnerabilities posed over the long term associated with the hazards identified in the Hazard Identification and Risk Assessment section. The strategies identified in this section drive mitigation activities based on existing capabilities while also identifying areas of potential future investment to build resilience across communities, critical facilities, and other infrastructure within Los Angeles County.

7.2 Mitigation Goals and Objectives

Mitigation goals are the long-term vision that the County hopes to achieve by implementing the various mitigation strategies described in this AHMP, as well as the broad guidelines that have shaped mitigation strategy development.

- **Goal 1: Protect life, property, infrastructure, the environment, and the economy through equitable mitigation strategies aimed at reducing risks of natural and human-caused hazards.**
    - Objective 1-1: Integrate vulnerable populations, including people with Access and Functional Needs (AFN), into the implementation of any potential mitigation actions.
    - Objective 1-2: Implement mitigation strategies that enhance resilience to disaster impacts across residential areas, commercial areas, infrastructure, high-hazard potential dams, and other critical facilities.
    - Objective 1-3: Inform strategic investments in climate adaptation, development, and redevelopment that are centered in equity and resilience.
- **Goal 2: Enhance community-wide partnerships in hazard mitigation across all levels of government, the private sector, and the public.**
    - Objective 2-1: Build a culture of disaster resilience and awareness of local hazards through public engagement, education, and outreach.
    - Objective 2-2: Strengthen direct coordination among Los Angeles County Operational Area partners to unify efforts for mitigation activities.
    - Objective 2-3: Utilize a whole community approach to address disparities in outcomes posed by the hazards identified in this AHMP.
- **Goal 3: Enhance planning, response, and recovery through hazard identification, assessment, mitigation, and resilience activities.**

  - Objective 3-1: Establish and maintain coordination between hazard mitigation activities and other emergency management functions.
  - Objective 3-2: Integrate hazard mitigation activities into preparedness for future large-scale planned events within Los Angeles County.
- **Goal 4: Ensure eligibility for FEMA grant funding to maximize equitable investment in hazard mitigation actions.**
  - Objective 4-1: Continue to meet all requirements for existing hazard mitigation grant programs used by the County.
  - Objective 4-2: Expand the County's ability to participate in grant programs not currently utilized by the County.

7.2.1 Changes in Mitigation Goals

The AHMP Advisory Committee reviewed the 2020 AHMP goals and updated them to reflect the most current County concerns and priorities. Therefore, the 2025 AHMP has introduced new goals and objectives to build a more resilient community. Table 7-1 (below) compares the 2025 AHMP goals with previous 2020 AHMP goals; all other goals above are new goals and objectives developed by the AHMP Advisory Committee.

Mitigation priorities change through time depending on the type of disaster impacting Los Angeles County, vulnerability, the strategies implemented, as well as other needs of the community. Priorities are also made based on current countywide Threat and Hazard Identification and Risk Assessment (THIRA) studies, National Risk Index Assessment, State Hazard Mitigation Plan (SHMP) and other local plans and guides. The previous 2020 AHMP integrated hazard data into several operational plans including but not limited to the General Plan, Operational Area Emergency Operations Plan (OAEOP), amongst others. Addressing these changes will help to address Los Angeles County hazard priorities and to have mitigation strategies focused on the hazards that impact the region at most. The plan also added additional hazards and addressed a larger vulnerable population.

Table 7-1 Mitigation Goal Updates

Goals Addressed in 2020 AHMP	Goals for 2025-2030 Planning Period	Changes
Build a culture and practice disaster resilience	Goal 2 (see above).	Goal expanded; previous goal integrated as an objective under Goal 2 in the current AHMP.
Better plan for, respond to, and recover from, hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 3 (see above).	Previous goal replaced with new goal.
More successfully adapt to hazards and disasters including climate change, drought, earthquake, dam failure, flood, landslide, tsunami, and wildfire that affect Los Angeles County.	Goal 1 (see above).	Previous goal replaced with new goal.

7.3 Existing Mitigation Capabilities

The mitigation strategies developed as part of this AHMP seek to maximize existing mitigation capabilities identified as currently available within the Los Angeles County Operational Area. These existing capabilities have been updated to reflect changes in human, technical, financial, legal, regulatory, education, and outreach resources since the 2020 AHMP.

7.3.1 Authorities, Policies, and Legal/Regulatory Resources

There are several existing authorities, policies, and other legal or regulatory resources applicable to hazard mitigation efforts in Los Angeles County. From the County Code of Ordinances to completed plans, these form the cornerstone of hazard mitigation activities by providing a foundation rooted in data, research, planning, Technical Ecological Knowledge (TEK) provided by our state and locally recognized indigenous communities, and elected officials' authority. The County aims to expand and improve upon these identified capabilities by adopting this AHMP, once approved, into the Safety Element of the Los Angeles County General Plan. This action will contribute to the County's ability to be considered for an additional cost-share on Public Assistance projects through the California Disaster Assistance Act. Table 7-2 provides an overview of existing capabilities related to authorities, policies, and legal/regulatory resources.

Table 7-2 Authorities, Policies, and Legal/Regulatory Resources

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County Operational Area Emergency Operations Plan (2023)	Establishes the coordinated emergency management system within the Los Angeles County Operational Area to prepare for, respond to, and recover from the effects of large-scale emergencies regardless of cause, location, or complexity.	All-Hazard	No
Los Angeles County General Plan (2024)	Provides the policy framework for how and where the unincorporated County will grow through the year 2035.	All-Hazard	Yes
Los Angeles County Comprehensive Floodplain	Reviews existing floodplain management programs in the County and recommends enhancements to them through 35	Flood Land Movement	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Management Plan (2021)	mitigation actions. This plan is currently being reviewed and updated with completion targeted for early 2026.		
Los Angeles County Comprehensive Floodplain Management Plan Repetitive Loss Area Analysis (2021)	Analyzes Repetitive Los Areas within Los Angeles County and fulfills Community Rating System requirements.	Flood Land Movement	Yes
County of Los Angeles Floodplain Management Plan Progress Report (2024)	Provides an annual update on the implementation of the action plan identified in the Comprehensive Floodplain Management Plan and on the implementation and evaluation of outreach projects.	Flood Land Movement	Yes
County of Los Angeles Repetitive Loss Area Analysis Progress Report (2023)	Provide an annual update on the implementation of the action plan identified in the Repetitive Loss Area Analysis to ensure there is a continuing and responsive planning process.	Flood	Yes
Los Angeles County Fire Plan (2023)	Describes the wildfire environment, history, and pre-fire management strategies to enhance the protection of lives, property, and natural resources from wildland fire.	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
Los Angeles County 2045 Climate Action Plan (2024)	Delineates the County's path toward meeting the goals of the Paris Agreement and achieving carbon neutrality for unincorporated Los Angeles County.	Wildfire Extreme Heat Drought Flooding	Yes
Our County: Los Angeles Countywide Sustainability Plan (2019)	Outlines how local governments and stakeholders can enhance the well-being of all County communities while adapting to climate change and reducing damage to the natural environment, particularly focusing on communities disproportionately burdened by pollution.	Wildfire Extreme Heat Drought Flooding	Yes
Los Angeles County Floodplain Management Ordinance	Aims to minimize public and private losses resulting from flood conditions via uniformly applied regulations in flood prone, mudflow, or flood related erosion areas.	Flood Land Movement	Yes
Los Angeles County Code – Title 32: Fire Code	To build a new structure (or an addition equal to or greater than 50% of existing square footage), the Los Angeles County Fire Code requires review of its location, type of construction, topography, slope, amount and arrangement of vegetation, and overall site	Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	settings—in order to create defensible space necessary for effective fire protection of homes in High Fire Severity Zones.		
Los Angeles County Code – Title 22: Planning and Zoning	Establishes the regulations governing land use and development and defines zoning for unincorporated Los Angeles County. Includes the Hillside Management Area Ordinance (Chapter 22.104), the Residential Design Standards Ordinance, and the Hillside Design Guidelines. These include requirements for development in Hillside Management Areas, which are defined as areas with 25% or greater natural slopes. The guidelines include specific and measurable design techniques that can be applied to residential, commercial, industrial, and other types of projects.	Wildfire Earthquake Land Movement	Yes
Los Angeles County Code – Title 31: Green Building Standards Code	Enhances the design and construction of buildings via building concepts with positive (or reduced negative) environmental impacts, and encourages sustainable construction practices	Extreme Heat Drought	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	across planning and design, energy efficiency, water conservation, material and resource efficiency, and environmental air quality.		
Los Angeles County Brush Clearance Program	Legally declares both improved and unimproved properties a public nuisance, and where necessary, requires the clearance of hazardous vegetation thereby creating defensible space for effective fire protection of property, life, and the environment. The Brush Clearance Program is a joint effort between the County of Los Angeles Fire Department and the County of Los Angeles Department of Agricultural Commissioner/Weights and Measures, Weed Hazard, and Pest Abatement Bureau (Weed Abatement Division).	Wildfire	Yes
Los Angeles County Code – Title 26: Building Code	Provides minimum standards to regulate the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment. Regulates construction	Earthquake Wildfire	Yes

Authority, Policy, or Resource	Description	Hazards Addressed	Potential to Affect Development
	near a known active earthquake fault (Chapter 1, Section 113), the materials and construction methods for construction in a Wildland-Urban Interface (WUI) Fire Area (Chapter 7A), structural design as it relates to earthquake hazards (Chapter 16, Section 1613), repair of certain buildings in High Earthquake Damage Areas (Chapter 94), earthquake hazard reduction for concrete tilt-up buildings (Chapter 95) and unreinforced masonry buildings (Chapter 96), among others. The Building Code also includes provisions for emergency housing during a proclaimed emergency.		

7.3.2 Human and Technical Resources

Existing human and technical resources across County Departments enable the County to plan, manage, conduct, and execute its wide range of hazard mitigation activities. The resources below represent a high degree of expertise in all facets of hazard mitigation available to support mitigation activities. The County aims to expand and improve upon these identified capabilities by expanding potential hazard training opportunities available to the Los Angeles County Operational Area. Additionally, as various special events are scheduled in Los Angeles County over the next five years, the County should seek to expand coordination and technical resources related to mass violence, cyber, and other special event-related hazards.

Table 7-3 provides an overview of existing capabilities related to human and technical resources.

Table 7-3 Human and Technical Resources

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Emergency Management Coordinator(s)	Los Angeles County Office of Emergency Management	• Maintains and updates the Los Angeles County Operational Area Emergency Operations Plan and Los Angeles County All-Hazard Mitigation Plan. • Coordinates local response and recovery activities in the Emergency Operation Center and in the field. • Works closely with local, state, and federal partners to support planning, training, exercise, public information, and resource coordination.
Engineer(s), Building Inspector(s), Code Enforcement Officer(s), Fire Marshalls, and Other Technical Staff	Los Angeles County Public Works and Fire Department	• Oversees the effective, efficient, fair, and safe enforcement of County of Los Angeles Building and Fire Codes.
Engineer(s), Construction Project Managers, and Other Technical Staff	Los Angeles County Public Works	• Provides direct (or contract) civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), Project	Los Angeles County Public Works	• Maintains and operates a wide range of local equipment and facilities and assists members of the public by

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
Manager(s), Equipment Operators, Maintenance and Construction Staff, and Other Technical Staff		providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	Los Angeles County Public Works	• Enforces the floodplain management ordinance ensuring that development proposals do not increase flood risk and that new developments are not located below the 100-year flood level. In addition, the floodplain administrator is responsible for planning and managing flood risk reduction projects throughout Los Angeles County.
Planner(s), Engineer(s), and Technical Staff	Los Angeles County Department of Regional Planning	• Develops and maintains the Los Angeles County General Plan, including the Safety Element. • Develops area plans based on the Los Angeles County General Plan to provide more specific guidance for the development of more specific areas. • Reviews proposed development, capital improvements, and other physical projects involving property for consistency and conformity with the Los Angeles County General Plan. • Anticipates and acts on the need for applicable new plans, policies, and code changes.

Resource	Department/Agency	Principal Activities Related to Hazard Mitigation
		• Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Procurement Services Manager	Los Angeles County Internal Services Department	• Provides a full range of municipal financial services and administers several licensing measures.
Comptroller Personnel	Los Angeles County Auditor – Controller	• Provides financial and grant services.
County Counsel Personnel	Los Angeles County Counsel	• Provides legal services for the County.
Fire Department Personnel	Los Angeles County Fire Department	• Provides fire protection services including response, fire prevention, and mitigation activities for the County.
Sheriff's Department Personnel	Los Angeles County Sheriff's Department	• Provides law enforcement services in the County.

7.3.3 Financial Resources and Programs

There are many existing financial resources, grant programs, and other funding mechanisms that enable current and future hazard mitigation activities. Sources for these resources and programs vary widely from local funding out of the County's General Fund to state and federal programs that aim to help local jurisdictions accomplish their hazard mitigation goals. The amount of funding available is variable and project-specific for many of these programs. Similarly, grant awards are based on the specific projects that are identified as the basis for the grant application. Table 7-4 provides an overview of existing capabilities related to financial resources and programs.

Table 7-4 Financial Resources and Programs

Resource or Program	Administrator	Purpose
General Fund	Chief Executive Office	Program operations and specific projects.
General Obligation Bonds	Auditor - Controller	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include but are not limited to: libraries, hospitals, parks, public safety facilities, and cultural and educational facilities.
Special Tax and Revenue Bonds	Controller	Revenue bonds are used to finance capital projects that: 1. Have an identified budgetary stream for repayment (e.g., specified fees, tax receipts); 2. Generate project revenue but rely on a broader pledge of general fund revenues to reduce borrowing costs; or 3. Finance the acquisition and installation of equipment for the local jurisdiction's general governmental purposes.
Vegetation Management Program	Cal FIRE	Cost-sharing program between Cal FIRE and private landowners, which focuses on the use of prescribed fire and/or mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands.
Wildfire Emergency and Mitigation Funds	Cal FIRE	Administers funding from FEMA, Bureau of Land Management, and U.S. Forest Service for

Resource or Program	Administrator	Purpose
		certain types of wildfire emergency and mitigation funding.
California Residential Mitigation Program	California Earthquake Authority	Created by the California Earthquake Authority and the Governor's Office of Emergency Services, "Earthquake Brace + Bolt: Funds to Strengthen Your Foundation" is the first incentive program offered by the California Residential Mitigation Program.
Public Health Emergency Preparedness Cooperative Agreement	Center for Disease Control and Prevention	Funds are intended to upgrade state and local public health jurisdictions' preparedness and response to bioterrorism, outbreaks of infectious diseases, and other public health threats and emergencies.
Hazard Mitigation Grant Program (HMGP)	FEMA	Administered by the California Governor's Office of Emergency Services (Cal OES), HMGP supports pre- and post-disaster mitigation plans and projects available to California communities after a presidentially declared disaster has occurred in California.
Pre-Disaster Mitigation (PDM) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Flood Mitigation Assistance (FMA) Grant Program	FEMA	Available annually as a nationally competitive Cal OES grant, the PDM Grant Program supports pre-disaster mitigation plans and projects.
Homeland Security	FEMA	Builds and sustains preparedness technical assistance activities in support of the four

Resource or Program	Administrator	Purpose
Preparedness Technical Assistance Program		homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.
Land and Water Conservation Funds	U.S. Department of the Interior	Supports the protection of federal public lands and waters and voluntary conservation on private land.
Community Action for a Renewed Environment	U.S. Environmental Protection Agency (EPA)	Offers means by which communities may organize/take action to reduce toxic pollution (e.g., in stormwater, etc.) through financial and technical assistance. Communities create partnerships that implement solutions to reduce releases of toxic pollutants and that minimize toxic exposures.
Clean Water State Revolving Fund	EPA	A loan program that provides low-cost financing to eligible entities on state and tribal lands for water quality projects, including all types of non-point source, watershed protection or restoration, estuary management projects, and more traditional municipal wastewater treatment projects.

Resource or Program	Administrator	Purpose
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development	Acquisition of real property, relocation and demolition, rehabilitation of residential and non-residential structures, construction of public facilities and improvements (e.g., water/sewer facilities, streets, neighborhood centers, etc.), and the conversion of school buildings for eligible purposes.
High Hazard Potential Dams (HHPD) Grant Program	FEMA	Provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of eligible high hazard potential dams.
State and Local Cybersecurity Grant Program	FEMA	Provides funding to eligible entities to address cybersecurity risks and threats to information systems owned or operated by, or on behalf of, state, local, or tribal governments.

7.3.4 Education and Outreach Resources

Engagement with the communities of Los Angeles County is an important component of mitigation efforts. The County of Los Angeles has multiple methods, formats, and venues to conduct outreach with community members and provide education on the hazard landscape in Los Angeles County. These activities ensure mitigation efforts align with community goals and include community input. Table 7-5 shows a list of existing resources for education and outreach.

Table 7-5 Education and Outreach Resources

Resource or Program	Agencies Potentially Involved	Purpose
Preparedness Fairs	Office of Emergency Management, Fire Department, Sheriff's Department, Public Works, Board of Supervisors	Engage with community members to provide education on hazards found in Los Angeles County and emergency preparedness for homes and businesses.
Personal Disaster Impact Surveys	Office of Emergency Management	Receive input and feedback on the hazard landscape from community members in Los Angeles County to inform the 2025 AHMP.
AHMP Draft Review Surveys	Office of Emergency Management	Receive input and feedback on sections of the AHMP from community members in Los Angeles County.
Homeless Outreach Services Team (HOST)	Sheriff's Department, Homelessness Services Organizations	Conduct outreach to People Experiencing Homelessness in areas prone to wildfires or flooding based on weather conditions.
Community Emergency Response Teams (CERT)	Fire Department	Educate community members about disaster preparedness and response in their communities.
Explorer Programs	Fire Department, Sheriff's Department	Educate youth about disaster preparedness and response in their communities.
Youth Climate Commission	Chief Sustainability Office	Educate and obtain input from youth on climate change impacts and mitigation efforts.

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7.3.5 National Flood Insurance Program Participation

The National Flood Insurance Program (NFIP) is administered by FEMA and provides affordable flood insurance to participating communities through a network of insurance providers. NFIP regulations must be enforced in Special Flood Hazard Areas (SFHAs). Flood insurance is required for structures in SFHAs with federally backed loans (e.g., most mortgages, Small Business Administration (SBA) loans) and FEMA grants along with any structures with SBA loans, regardless of flood zone. Flood insurance is required to be maintained for the life of the federally backed loan and in perpetuity, regardless of change in ownership, in the case of FEMA grants.

The Los Angeles County Board of Supervisors adopted the County Floodway Ordinance (Los Angeles County Code Title 11, Chapter 11.60) in March 1980. This ordinance included the first County Floodway Maps and paved the way for the County to begin participation in NFIP on behalf of unincorporated residents. The County's participation means that residents (owners and renters) in the unincorporated communities within Los Angeles County are eligible for NFIP flood insurance and Federal flood disaster assistance. The first FEMA Flood Insurance Rate Maps (FIRMs) became effective on December 2, 1980. Since 1980, the County has continued robust participation in NFIP. The FEMA FIRMs were digitized in September 2008 and have been revised over the years by numerous Letters of Map Change and by large-scale Physical Map Revisions for the Ballona Creek watershed and several watersheds in the Santa Monica Mountains (Triunfo Creek, Topanga Canyon and others) in December 2018, the Los Angeles County coastline in April 2021, and the Santa Clara River watershed in June 2021. These maps are available to the public on the Los Angeles County Public Works (PW) website at dpw.lacounty.gov/floodzone.

Los Angeles County also participates in the NFIP's Community Rating System (CRS) program. The CRS program is a voluntary program for communities that engage in community floodplain management activities, which exceed the minimum NFIP standards. CRS communities benefit from a discount on flood insurance rates and improved floodplain management programs. CRS uses a class rating system between 1 and 9 to determine flood insurance premium reductions for residents. As of April 1, 2022, Los Angeles County is a Class 6 CRS community; therefore homeowners and

renters who live in a SFHA can receive up to a 20% discount on their flood insurance policies.

The County's implementation and enforcement of local floodplain management regulations for development in SFHAs are covered in Los Angeles County Building Codes with the most recent update completed in 2023. Title 26, Chapter 1, includes requirements for development within flood hazard areas. Other relevant ordinances include other chapters in Title 26 (Building Code) along with Titles 27 (Electrical Code), Title 28 (Plumbing Code), Title 29 (Mechanical Code), Title 30 (Residential Code), and Title 33 (Existing Building Code). Implementation and enforcement are also covered in the Los Angeles County Subdivision Code (Title 21) and Planning and Zoning Code (Title 22). The NFIP for unincorporated communities is administered by the Department of Public Works (LACPW) Stormwater Engineering Division, which serves as the County's floodplain manager, coordinates with LACPW's Building and Safety and Land Development Divisions and with the Los Angeles County Department of Regional Planning in their enforcement of the County's floodplain management regulations, and participates in FEMA's Community Assisted Visits, which typically occur on a 5-year cycle.

LACPW continues to enforce NFIP regulations for building permit applications determined by Building and Safety officials to be substantial improvement or repair of substantial damage. Los Angeles County also requires all residential buildings undertaking substantial improvement to have their lowest floor elevated 1 foot above the 100-year flood elevation. Additionally, Los Angeles County conducted a Repetitive Loss Area Analysis in 2020, which serves as a specific plan for reducing damage from flooding in repetitive loss areas.

After an event, Public Works staff assess the unincorporated area buildings within the extent of the event. The assessment will identify the buildings that appear to have damages affecting 50 percent or greater of the building. If such a building is in flood-prone areas identified by FEMA's Flood Insurance Rate Maps, County maps (Floodway Maps or Assessor's Maps), or identified by Public Works to be in a Repetitive Loss Area, will undergo further evaluation by Public Works staff on whether the building meets FEMA's definition of substantial improvement/substantial damage (SI/SD). A building that meets FEMA's SI/SD definition will be required to have the entire building upgraded to meet National Flood Insurance Program (NFIP) standards (Title 44, Code

of Federal Regulations, Section 60.3). Los Angeles County Code Title 26, Section 110.1 requires the County to enforce as a minimum the current Federal Flood Plain Management Regulations defined in Title 44, Code of Federal Regulations, Section 60.3, for buildings, structures, and grading located in whole or in part in flood hazard areas. (Ord. 2013-0048 § 2, 2013; Ord. 2010-0053 § 2, 2010; Ord. 95-0065 § 3 (part), 1995.)

7.4 Identification and Analysis of Mitigation Strategies

Potential mitigation actions were identified for each hazard identified in Section 6 in an effort to ensure as comprehensive a mitigation strategy as possible. Multiple mitigation options were then analyzed against the goals and objectives delineated in this section with a focus on new and existing buildings. A combination of new and ongoing mitigation actions aimed at reducing the effects of the identified hazards were compiled into the list of mitigation actions in the following subsection. This list includes a wide range of potential types of mitigation actions, including:

- Local Plans and Regulations.
- Structure and Infrastructure Projects.
- Natural Systems Protection.
- Education and Awareness Programs.

A notable update to the 2025 AHMP was the integration of human-caused threats and corresponding potential mitigation actions. The AHMP Planning Team also reviewed FEMA's Mitigation Ideas document to incorporate national best practices in the list of potential mitigation actions.

7.4.1 Mitigation Strategies

01	*Title:* **Support and Expand Countywide Vegetation Management and Fire Prevention Efforts**
Source: Los Angeles County Fire Department	
Type: Natural Systems Protection	
Description: Conduct passive protection measures such as creating defensible space buffers around residential and non-residential structures through the removal of flammable vegetation, managing and/or reducing hazardous fuels, creating firebreaks, fire-resistive landscaping and construction, and clearing dead vegetation, among others. Engage indigenous communities to inform vegetation management and fire prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

02	*Title:* **Enhance Community Engagement in Wildfire Protection and Prevention**
Source: Los Angeles County Department of Regional Planning	
Type: Education and Awareness Programs	
Description: Engage residents and businesses in high fire risk communities to educate them on community-focused mitigation and risk reduction strategies, emergency preparedness and evacuation readiness, and opportunities to get involved in fire safety-related community initiatives. Engage indigenous communities to inform protection and prevention practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Wildfire** *Hazard:* ***Severe Wind/Tornado***

03	*Title:* **Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Following a wildfire, assess burn scar for significant mud and debris flow risks to produce mud and debris flow phase maps for first responding agencies to prepare for potential evacuations. Recommend mitigation strategies to prevent mud and debris flow impacts.	*Hazard:* **Wildfire** *Hazard:* ***Flooding***

04	*Title:* **Strengthen Operational Continuity Capabilities for Critical Facilities**
Source: Los Angeles County Department Public Health, among others.	
Type: Structure and Infrastructure Projects	
Description: Conduct robust continuity planning to ensure the continued performance of essential functions in the event critical facilities are impacted by various hazards. Build capabilities that support operational continuity such as alternate or uninterrupted power supply, workforce development and cross-training, emergency communications, and data backup or failover hardware.	*Hazard:* **Wildfire** *Hazard:* ***Extreme Heat*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Cyber Incidents**

05	*Title:* **Incorporate Hazards in Local Planning, Land Use, and Development Codes**
Source: Los Angeles County Department of Public Works and Regional Planning	
Type: Local Planning and Regulations	
Description: Develop, maintain, and leverage opportunities to strengthen relevant ordinances that govern land use, building codes, and development in high-risk hazard areas. Incorporate mitigation actions in community planning such as Community Wildfire Plans, Flood Management Plans, and the County General Plan, among many others.	*Hazard:* **Wildfire** *Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* ***Flooding***

06	*Title:* **Increase Public Awareness of Climate Change Effects on Local Hazards**
Source: Los Angeles County Chief Sustainability Office	
Type: Education and Awareness Programs	
Description: Engage with communities on ways climate change impacts various natural hazards along with mitigation actions and available resources for climate adaptation and resilience. Efforts should focus on how communities can take action or support existing County programs including funding available to the public. Public engagement efforts should be accessible, ensure people with Access and Functional Needs are included in outreach, and use materials with multiple language options.	*Hazard:* **Wildfire** *Hazard:* **Extreme Heat** *Hazard:* **Drought** *Hazard:* **Land Movement** *Hazard:* ***Severe Wind/Tornado*** *Hazard:* **Flooding**

07	*Title:* **Expand Stormwater Management, Drainage, and Outlet Planning**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Continue robust stormwater management programs. Conduct studies to inform measures to improve outlet and drainage planning and prevent flood damage to communities in high-risk areas. These efforts should also prevent flood damage to County-maintained roadways, including evacuation egress and emergency services ingress, while supporting potential groundwater recharge.	*Hazard:* **Flooding** *Hazard:* **Drought** *Hazard:* **Transportation Incident**

08	*Title:* **Construct and Maintain Localized Flood Control Improvements**
Source: Los Angeles County Department of Public Works	
Type: Structural and Infrastructure Projects	
Description: Maintain existing flood control mechanisms by drainage system maintenance, sediment and debris clearance, and other actions. Leverage opportunities to construct flood control improvements.	*Hazard:* **Flooding**

09	*Title:* **Preserve Floodplains as Public Use Open Spaces**
Source: Los Angeles County Department of Public Works, among others.	
Type: Natural Systems Protections	
Description: Preserve and expand public use open spaces that capture stormwater with the aim of reducing localized flooding while also providing green space and recreational opportunities to communities. Prioritize floodplains and watersheds in County-owned public use open spaces near flood risk areas. Use stormwater best management practices in projects involving open spaces to support natural water collection and conservation. Incorporate floodplain preservation into future park improvements.	*Hazard:* **Flooding**

10	*Title:* **Harden Critical Facilities and Infrastructure from Seismic Damage**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Conduct seismic assessments to prioritize retrofitting and other seismic mitigation actions such as bracing or seismic shutoff valves. Efforts should focus on critical facilities for community lifelines such as hospitals, public safety facilities, utility sites, high-hazard potential dams, and transportation assets (i.e., bridges, roadways, airports, and others).	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Dam Failure**

11	*Title:* **Prevent Impacts to the Transportation System**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Hazard impacts to the transportation system in Los Angeles County have far-reaching potential for cascading effects across multiple lifelines. Mitigation activities for multiple hazards should focus on preventing or lessening impacts to transportation. Activities may include stabilization efforts along County-maintained roads, reinforcing transportation assets, or other seismic mitigation actions.	*Hazard:* **Earthquake** *Hazard:* ***Land Movement*** *Hazard:* **Transportation Incident**

12	*Title:* **Continue Efforts to Enhance Dam Safety and Reduce Long-Term Vulnerabilities with High Hazard Potential Dams**
Source: Los Angeles County Department of Public Works	
Type: Structure and Infrastructure Projects	
Description: Upgrade infrastructure to ensure the long-term integrity and safe operation of County-owned dam facilities. Potential actions could include strengthening of dams, sediment management activities, regular inspections, continuous maintenance, integrating advanced technologies, and emergency preparedness efforts.	*Hazard:* **Earthquake** *Hazard:* **Dam Failure**

13	*Title:* **Assess Water Resilience in Los Angeles County**
Source: Los Angeles County Department of Public Works	
Type: Local Planning and Regulations	
Description: Conduct assessments and studies to monitor the water supply and develop recommendations for other water systems. Identify potential secondary water sources or other contingency measures for ensuring water system resilience during drought conditions.	*Hazard:* **Drought**

14	*Title:* **Expand Drought-Tolerant Landscaping and Design**
Source: Los Angeles County Chief Sustainability Office and Department of Regional Planning	
Type: Natural Systems Protection	
Description: Integrate drought mitigation into landscaping and design measures undertaken by the County. Prioritize native and drought-tolerant plants when selecting landscaping designs. Use permeable materials for pavers, driveways, walkways, and roadways to reduce runoff and promote groundwater recharge that incorporate indigenous- informed practices aligned with Traditional Ecological Knowledge (TEK).	*Hazard:* **Drought**

15	*Title:* **Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies**
Source: Los Angeles County Chief Sustainability Office, Department of Regional Planning, Department of Economic Opportunity, Department of Public Health, and Department of Public Works, among others.	
Type: Local Planning and Regulations	
Description: Increase shade cover provided by vegetation such as planting native and drought-tolerant trees along with smaller plants such as shrubs, grasses, and groundcover. Increase the tree canopy in County parks and open concrete or asphalt spaces in the public right of way or County-owned parking lots. Conduct assessments to identify communities considered urban heat islands that are at highest need for an increase in tree canopy or other heat mitigation activities. Advance cooling strategies such as constructing shade structures, installing splash pads, operating cooling centers, modernizing air conditioning systems, and expanding the availability of cool roofing infrastructure that reflects heat away from buildings. Ensure mitigation actions address heat impacts faced by people with Access and Functional Needs. Many of these actions have a secondary benefit mitigating the effects of climate change by promoting carbon sequestration, the capture and storage of CO2 from the atmosphere. Additionally, increasing green space and shade cover in urban areas can advance environmental justice.	*Hazard:* ***Extreme* Heat**

16	*Title:* **Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines**
Source: Los Angeles County Chief Sustainability Office and Department of Beaches and Harbors	
Type: Natural Systems Protection	
Description: Conduct activities to replace sediment lost due to erosion or coastal storms. Assess the need for other sediment protection measures such as planting certain types of vegetation. Consider activities that prevent wind from blowing sand off beaches and impacts from storm surge in high-risk areas. These actions help protect coastal roadways and other infrastructure along with ensuring recreation opportunities remain for residents and visitors.	*Hazard:* **Flooding** *Hazard:* **Tsunami**

17	*Title:* **Conduct Multi-Discipline Training and Exercise Programs**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Identify opportunities for joint training and exercises for mass violence and cyber incident response across disciplines of law enforcement, fire and emergency medical services, medical examiner, private sector, and others. Each training and exercise should include mass violence rescue and evacuation techniques for AFN populations.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

18	*Title:* **Strengthen Partnerships and Coordination Among Local Agencies**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Expand collaborative agreements with other agencies to share resources during large-scale emergencies. Strengthen partnerships with local agencies for resource sharing. Enhance response capabilities during major incidents.	*Hazard:* **Mass Violence** *Hazard:* **Cyber Incidents**

19	*Title:* **Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Use physical security measures such as bollards, water-filled barricades, vehicle barriers, and others. Identify mitigation measures for upcoming special events such as the World Cup, Super Bowl, and Olympics. Conduct special event training on topics such as crowd management, sporting event safety, and stadium evacuation. Incorporate Family Assistance Center readiness into special event planning.	*Hazard:* **Mass Violence**

20	*Title:* **Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers**
Source: Los Angeles County Chief Sustainability Office, Department of Economic Opportunity, Department of Public Health, and Department of Public Works	
Type: Education and Awareness Programs	
Description: Implement outreach and education to workers in low-wage and high hazard industries in LA County that are disproportionately impacted by extreme heat. Partner with organizations providing services to people with Access and Functional Needs on heat response strategies. Expand awareness of cooling centers and other heat respite options for unhoused populations. Increase workforce development opportunities to expand the availability of green infrastructure.	*Hazard:* ***Extreme* Heat**

21	*Title:* **Increase Field Response and Coordination Capabilities**
Source: Los Angeles County Sheriff's Department and Office of Emergency Management	
Type: Education and Awareness Programs	
Description: Enhance field coordination capabilities at large-scale planned events and no-notice incidents such as wildfires, mass violence, and others. Potential actions could include investments in new redundant communications systems, response vehicles, alert and warning capabilities, and other field operations equipment.	*Hazard:* **Wildfire** *Hazard:* **Mass Violence**

22	*Title:* **Strengthen Public Health Prevention and Preparedness Measures**
Source: Los Angeles County Office of Emergency Management, Department of Public Health, Department of Health Services, and Fire Department	
Type: Education and Awareness Programs	
Description: Continue and expand mass vaccination and immunization efforts. Coordinate healthcare surge preparedness and response efforts. Conduct disease surveillance, monitor early warning systems, and coordinate outbreak response. Educate communities and businesses about health implications related to wildfire recovery and hazardous materials. Liaise with health system partners to understand hospital surge capacity within the County. Maintain and deploy emergency stockpiles. Incorporate potential climate change-related infectious disease implications into public health preparedness planning.	*Hazard:* **Public Health Emergencies**

7.5 Status of Previous Mitigation Efforts

Table 7-6 below shows the status of mitigation strategies described in the 2020 AHMP. Departments have made significant progress on some of these mitigation strategies, partially but not fully completing some of these efforts. As such, each strategy from the 2020 AHMP have been rolled into the mitigation strategies described in this section.

Table 7-6 Status of Mitigation Efforts

2020 AHMP Strategy	Status	2025 AHMP Strategy
Red Flag Warning Public Outreach	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention

2020 AHMP Strategy	Status	2025 AHMP Strategy
Vegetation Management Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Fireproof Coating of Critical Facilities	Not Completed/ Ongoing	Enhance Community Engagement in Wildfire Protection and Prevention
Auxiliary Power for Critical Facilities	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Earthquake-Resistant Ductile Iron Pipes Replacement	Not Completed/ Ongoing	Harden Critical Facilities and Infrastructure from Seismic Damage
Watershed Ecosystem Restoration	Not Completed/ Ongoing	Preserve Floodplains as Public Use Open Spaces
Green Streets / Living Streets	Not Completed/ Ongoing	Expand Drought-Tolerant Landscaping and Design
Coordinated Data Collection and Database Systems	Not Completed/ Ongoing	Strengthen Partnerships and Resource Coordination Among Local Agencies
Brush Clearance Program	Not Completed/ Ongoing	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts
Wildland Urban-Interface Ordinance	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Urban Forest Management Plan	Not Completed/ Ongoing	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies

2020 AHMP Strategy	Status	2025 AHMP Strategy
Community Wildfire Protection Plans	Not Completed/ Ongoing	Incorporate Hazards in Local Planning, Land Use, and Development Codes
Pre-Disaster Professional Support	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities
Fuel Trailer Project	Not Completed/ Ongoing	Strengthen Operational Continuity Capabilities for Critical Facilities

7.6 Prioritization and Implementation of Mitigation Actions

Potential mitigation actions were prioritized using the FEMA National Risk Index (NRI) score and information from the 2024 Los Angeles Threat and Hazard Identification and Risk Assessment (THIRA), which both address hazards by frequency, severity, and impact. Both the NRI and THIRA follow established processes and use a standardized risk assessment methodology. The NRI incorporates multiple variables including physical impacts posed by hazards in addition to social vulnerability data that communicates risks specific to a certain community. Table 7-7 provides an overview of the NRI results for Los Angeles County across 18 hazards. Hazards rated as Relatively Low, Not Applicable, or No Rating were not included in this AHMP as they are uncommon in frequency in Los Angeles County; all other hazards are covered in this plan.

Table 7-7 FEMA National Risk Index Hazards

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Earthquake	100.0	Very High	Yes | Section 6.3
Wildfire	99.9	Very High	Yes | Section 6.2
Extreme Heat	98.4	Relatively High	Yes | Section 6.4
Tornado	97.6	Relatively High	Yes | Section 6.10

Hazard	NRI Score (out of 100.0)	Score Description	Covered in Plan?
Landslide	96.3	Relatively High	Yes | Section 6.8
Lightning	95.0	Relatively High	Yes | Section 6.2/ 6.6
Riverine Flooding	90.8	Relatively Moderate	Yes | Section 6.6
Drought	73.8	Relatively Moderate	Yes | Section 6.5
Strong Wind	73.5	Relatively Moderate	Yes | Section 6.10
Tsunami	63.5	Relatively Moderate	Yes | Section 6.10
Winter Weather	48.6	Relatively Low	Not Prioritized
Hail	48.1	Relatively Low	Not Prioritized
Coastal Flooding	43.3	Very Low	Not Prioritized
Avalanche	33.7	Very Low	Not Prioritized
Cold Wave	0.0	No Rating	Not Prioritized
Hurricane	N/A	Not Applicable	Not Prioritized
Ice Storm	N/A	Not Applicable	Not Prioritized
Volcanic Activity	N/A	Not Applicable	Not Prioritized

The THIRA is a process that communities undertake to assess risk and set capability targets to focus their preparedness efforts and strengthen response and recovery capabilities. There are three primary focuses of the THIRA: threat and hazard identification, impacts analyses that include the specific demographics of the community, and a description of existing response and recovery capabilities. The 2024 Los Angeles/Long Beach THIRA was reviewed as part of this hazard mitigation planning effort and all threats and hazards identified were included as part of this AHMP. Additionally, the THIRA's identification of several human-caused threats with potential to impact Los Angeles County influenced the decision to include such threats in this AHMP. Table 7-8 shows a crosswalk of the hazards and threats identified in the THIRA and their corresponding sections in this AHMP.

Table 7-8 2024 THIRA and 2025 AHMP Crosswalk

2024 THIRA Hazard/Threat Name	2025 AHMP Hazard/Threat Name	Covered in Plan?
Biological Attack	Public Health Emergencies	Yes | Section 6.14
Complex Coordinated Terrorist Attack	Mass Violence	Yes | Section 6.11
Cyber Attack	Cyber Incident	Yes | Section 6.12
Earthquake	Earthquake	Yes | Section 6.3
Flood	Flooding	Yes | Section 6.6
Pandemic – Human	Public Health Emergencies	Yes | Section 6.14
Radiological Attack	Public Health Emergencies	Yes | Section 6.14
Transportation Accident	Transportation Incident	Yes | Section 6.13
Wildfire	Wildfire	Yes | Section 6.2

Additional criteria used to prioritize potential mitigation actions also included the following components:

- Actions that prioritize equity and integrate vulnerable populations, including people with AFN.
- Potential benefits of the action to prevent a major hazard.
- Actions that have social support to build a culture and practice of resilience.
- Cost of the action versus the potential benefit to prevent a major hazard.
- Availability of funding and actions that support grant requirements.
- Political support to remedy or prevent a major health or safety hazard.
- Actions that are technically, legally, environmentally, and economically feasible.
- Actions that the County has the administrative capabilities to implement.
- Actions that are related to mitigating long-term vulnerabilities to County-owned High Hazard Potential Dams will automatically be given a HIGH priority.

7.6.1 Priority Levels

- **High-Priority Mitigation Actions:** are essential and require immediate attention to address critical risks and safeguard life, property, or essential systems.

- **Medium-Priority Mitigation Actions:** are important but less urgent, supporting overall risk reduction and resilience goals while allowing for planned implementation.
- **Low-Priority Mitigation Actions:** address lower-risk concerns or long-term objectives and can be deferred without immediate impact to safety or core functions.

7.6.2 Changes in Criteria

The 2014 Los Angeles County AHMP's Mitigation Action Matrix was prioritized using the Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) method, which FEMA had recommended as a prioritization procedure in the early to mid-2000s. The 2020 AHMP replaced the use of STAPLEE with a more streamlined prioritization process that included the following:

- To remedy or prevent a major health/safety hazard, a mitigation project must have political support.
- To build a culture and practice of disaster resilience, a mitigation project must have social support.
- To meet FEMA HMA grant criteria, a mitigation project must be technically, legally, environmentally, and economically feasible and the jurisdiction must have the administrative capabilities to implement it.

This prioritization method used in the 2020 AHMP has been adapted and incorporated into the prioritization criteria described previously in Section 7.6.

7.7 Integration with Other Plans

The County of Los Angeles ensures that mitigation is a countywide effort with multiple departments contributing to critical activities that reduce hazard risks. These actions are captured in other discipline-specific plans in addition to the AHMP, including those listed in Table 7-9.

Table 7-9 AHMP Integration with Other Plans

Plan	Authored By	Hazard(s)	Covered in Plan?
Comprehensive Floodplain Management Plan	Los Angeles County Department of Public Works	Flood	Yes
Repetitive Loss Area Analysis Report	Los Angeles County Department of Public Works	Flood	Yes
Climate Action Plan	Los Angeles County Department of Regional Planning	Wildfire Extreme Heat Flooding Drought	Yes
Sustainability Plan	Los Angeles County Chief Sustainability Office	Wildfire Extreme Heat Flooding Drought	Yes
County Fire Plan	Los Angeles County Fire Department	Wildfire	Yes

7.8 Mitigation Action Plan

Table 7-10 represents a Mitigation Action Plan to reduce risks of the hazards identified in this AHMP. Notably, many County departments include discipline-specific mitigation actions within other related plans mentioned in the above section. Some actions that mitigate risk of natural hazards that are covered elsewhere may not be explicitly listed or may be referred to in general terms while specific details are available in other related plans.

Table 7-10 Mitigation Action Plan

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
01	HIGH	**Wildfire** ***Severe Wind/Tornado***	Support and Expand Countywide Vegetation Management and Fire Prevention Efforts	HMGP	Annual	LACoFD, PW
02	HIGH	**Wildfire** ***Severe Wind/Tornado***	Enhance Community Engagement in Wildfire Protection and Prevention	HMGP	Quarterly	LACoFD, DRP, OEM, LASD
03	HIGH	**Wildfire** ***Flooding***	Perform Post-Fire Flooding, Debris Flow, and Mud Flow Risk Assessments and Mitigation Activities	HMGP, FMA	Annual	PW, LACoFD, OEM
04	HIGH	**Wildfire** ***Extreme Heat***		UASI, SHSP	Annual	OEM, PW, DPH,

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
		Severe Wind/Tornado	Strengthen Operational Continuity Capabilities for Critical Facilities			LACoFD, LASD, ISD
		Cyber Incidents				
05	HIGH	**Wildfire**	Incorporate Hazards in Local Planning, Land Use, and Development Codes	HMGP, FMA	1-3 Years	DRP, PW
		Earthquake				
		Land Movement				
		Severe Wind/Tornado				
		Flooding				
06	MEDIUM	**Wildfire**	Increase Public Awareness of Climate Change Effects on Local Hazards	FMA, Prop 4	Annual	DRP, CSO, CEO
		Extreme Heat				
		Drought				
		Land Movement				
		*S****evere Wind/Tornado***				
		Flooding				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
07	HIGH	**Flooding**	Expand Stormwater Management, Drainage, and Outlet Planning	FMA	1-5 Years	PW
		Drought				
		Transportation Incident				
08	HIGH	***Flooding***	Construct and Maintain Localized Flood Control Improvements	FMA	1-5 Years	PW
09	MEDIUM	***Flooding***	Preserve Floodplains as Public Use Open Spaces	FMA, Prop 4	1-5 Years	PW, DRP, DPR
10	HIGH	**Earthquake**	Harden Critical Facilities and Infrastructure from Seismic Damage	HMGP	1-5 Years	PW, ISD
		Land Movement				
		Dam Failure				
11	MEDIUM	**Earthquake**	Prevent Impacts to the Transportation System	HMGP	1-5 Years	PW, LASD
		Land Movement				
		Transportation Incident				

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
12	HIGH	**Earthquake** **Dam Failure**	Conduct Seismic Strengthening at County-Owned Dams	FMA, HHPD	1-5 Years	PW
13	MEDIUM	**Drought**	Assess Water Resilience in Los Angeles County	Prop 4	1-5 Years	PW, DRP
14	MEDIUM	**Drought**	Expand Drought-Tolerant Landscaping and Design	Prop 4	1-5 Years	DPR, DRP, PW, CSO
15	HIGH	**Extreme Heat**	Address Urban Heat Islands by Investing in Green Infrastructure and Cooling Strategies	Prop 4	1-5 Years	CSO, DRP, DEO, DPH, PW, DPR
16	HIGH	**Flooding** **Tsunami**	Increase Coastal Resilience, Prevent Erosion, and Protect Shorelines	FMA, Prop 4	1-5 Years	CSO, DBH, PW
17	HIGH	**Mass Violence** **Cyber Incidents**	Conduct Multi-Discipline Training and Exercise Programs	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
18	MEDIUM	**Mass Violence** **Cyber Incidents**	Strengthen Partnerships and Resource Coordination Among Local Agencies	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Action No.	Priority	Hazard	Action Name	Potential Funding Source	Expected Time Frame	Lead Agencies
19	MEDIUM	**Mass Violence**	Incorporate Mass Violence Prevention and Mitigation Efforts into Special Event Planning	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD
20	HIGH	**Extreme Heat**	Extreme Heat Risk Education and Safety Outreach for Residents and Vulnerable Workers	Prop 4	1-5 Years	CSO, DEO, DPH, PW, DAD
21	HIGH	**Public Health Emergencies**	Strengthen Robust Public Health Prevention and Preparedness Measures	UASI, SHSP, PHEP, HPP	1-5 Years	DPH, OEM, DHS, LACoFD
22	MEDIUM	**Wildfire** **Mass Violence**	Increase Field Response and Coordination Capabilities	UASI, SHSP	1-5 Years	LASD, OEM, LACoFD

Agency Key:
CEO = Los Angeles County Chief Executive Office
CSO = Los Angeles County Chief Sustainability Office
DAD=Los Angeles Department of Aging and Disabilities
DBH = Los Angeles County Department of Beaches and Harbors
DEO = Los Angeles County Department of Economic Opportunity
DHS = Los Angeles County Department of Health Services
DPH = Los Angeles County Department of Public Health
DPR = Los Angeles County Department of Parks and Recreation
PW = Los Angeles County Public Works
DRP = Los Angeles County Department of Regional Planning
ISD = Los Angeles County Internal Services Department
LACoFD = Los Angeles County Fire Department.
LASD = Los Angeles County Sheriff's Department
OEM = Los Angeles County Chief Executive Office - Office of Emergency Management

Grant Program Key:
FMA = Flood Mitigation Assistance
HMGP = Hazard Mitigation Grant Program
HPP = Hospital Preparedness Program
PHEP = Public Health Emergency Preparedness
SHSP = State Homeland Security Program
UASI = Urban Area Security Initiative

8 Plan Maintenance

8.1 Community Participation in Plan Maintenance

The Hazard Mitigation Plan will be reviewed regularly, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. Stakeholders' engagement will be prioritized throughout the development and monitoring process, fostering transparency and accountability.

To maintain transparency and community involvement, the County has outlined several measures for continued public participation:

- **Public Access to Hazard Mitigation Documents:** A copy of the 2025 AHMP will be maintained on the Los Angeles County Hazard Mitigation Program website along with contact information. Los Angeles County OEM will notify the public of any changes or updates, including mitigation projects identified in the plan as they are implemented, via social media, and traditional local media channels.
- **Annual Public Engagement Opportunities:** Los Angeles County OEM will endeavor to hold multiple in-person public engagement opportunities for hazard mitigation to keep the public informed of progress on hazard mitigation projects, obtain ongoing public feedback, and educate the public about the County's hazard mitigation efforts.
- **Online Portal:** A Los Angeles County Hazard Mitigation Program website will be established to provide the public with more information on hazard mitigation and project updates. This portal will serve as a mechanism to obtain continuous public feedback as projects are implemented and offers access to mitigation resources.
- **Standing Advisory Committee:** The Hazard Mitigation Advisory Committee will be expanded to a standing status and will meet at least once per year or more often as determined necessary to support hazard mitigation projects. The standing Hazard Mitigation Advisory Committee will be comprised of representatives from diverse community groups to provide ongoing input and oversight of hazard mitigation efforts. The standing Hazard Mitigation Advisory Committee will also serve as an important forum for future updates of the AHMP.

These activities ensure that the community remains informed and actively engaged in the plan's implementation and maintenance.

8.2 Monitoring, Evaluation, and Maintenance

To ensure the continued effectiveness of this All-Hazard Mitigation Plan (AHMP), effective monitoring and evaluation will be conducted throughout the plan implementation period. Regular assessments will monitor progress and evaluate the achievements of the intended outcomes. Performance metrics will be developed to quantify the impact of each mitigation action, allowing for data driven adjustments and refinements.

The plan will be reviewed annually to assess progress on mitigation actions. Annual review will include the following elements:

- **Annual Review Worksheets:** Every year, LA County OEM will email each member of the Hazard Mitigation Advisory Committee an Annual Review Worksheet to complete. As shown in Appendix E, the Annual Review Worksheet reflects the FEMA Local Hazard Mitigation Plan Review Tool and includes the following sections: planning process, hazard profile, risk assessment, and mitigation strategy. Each member of the Hazard Mitigation Advisory Committee will email completed worksheets back to LA County OEM to review. LA County OEM will summarize these findings and email them out to the committee. Additionally, the findings from the review worksheets will be presented to the full Hazard Mitigation Advisory Committee at its next regular meeting.
- **Mitigation Progress Project Reports:** Mitigation actions will be monitored and updated using the Mitigation Project Progress Report. During each annual review, each department or agency currently administering a mitigation project will submit a progress report to LA County OEM. For projects that are being funded by a FEMA mitigation grant, FEMA quarterly reports may be used as the preferred reporting tool. As shown in Appendix E, the progress report will discuss the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them.
- **Post-Incident Mitigation Review:** Following a major disaster event impacting Los Angeles County, a post-disaster review will be initiated by LA County OEM to evaluate the need to update the AHMP based on the circumstances of the disaster and incorporate any specific mitigation actions required due to the

incident. If LA County OEM finds that an update to the AHMP is needed, the Hazard Mitigation Advisory Committee will be convened to begin drafting the update.

8.3 Criteria for Updating the Hazard Mitigation Plan

The All-Hazards Mitigation Plan (AHMP) is required to be updated every five years in compliance with the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA guidance (44 CFR § 201.6). The update process is not merely an administrative requirement but a critical mechanism to evaluate the plan's effectiveness in reducing risk and guiding mitigation strategies.

1. Review of Past Actions and Effectiveness

The update process begins with a thorough review of the mitigation actions outlined in the previous plan. This includes:

- Evaluating the implementation status of each action (completed, in progress, not started).
- Assessing the impact and effectiveness of completed actions in reducing hazard risk.
- Determining if the objectives are still relevant or require modification based on new data or circumstances.

2. Integration of New Data and Changing Conditions

- Hazard profiles and risk assessments are updated with new hazard event data, climate science, and changes in development or land use.
- Demographic shifts and infrastructure changes are reviewed to reassess vulnerability.
- Technological advancements or improved modeling tools (e.g., Hazus, National Risk Index) are incorporated to refine risk analysis.

3. Community and Stakeholder Input

The update process must actively include community participation to maintain transparency and ensure the plan reflects local priorities. This includes:

- Public workshops and surveys.
- Targeted outreach to vulnerable populations including those with Access and Functional Needs (AFN).
- Feedback from County departments, cities, NGOs, and regional partners.

4. Performance Evaluation and Metrics

To ensure effectiveness, the plan maintenance strategy includes:

- Annual progress reports that monitor implementation progress and identify barriers.
- Metrics to evaluate the reduction of risk or exposure over time.
- Documentation of lessons learned from real events and exercises to inform changes.

5. Revision of Goals, Objectives, and Actions

Based on the evaluation findings, the plan's goals and mitigation actions are revised to improve alignment with current capabilities, risk levels, and funding opportunities. Each updated action includes:

- Clear responsibilities.
- Realistic timelines.
- Evaluation metrics to measure future success.

8.4 Plan Update

The 2025 LHMP includes an updated methodology for future revisions, ensuring compliance with federal and state guidelines. A full plan update will occur every five years.

- **2030 AHMP Update Kickoff:** LA County OEM will convene the Hazard Mitigation Advisory Committee for a meeting to review the worksheet findings and endeavor to begin the process of updating the AHMP in approximately November 2028. The planning process should begin a minimum of 18 months prior to the plan's expiration. LA County OEM, in consultation with the Hazard Mitigation Advisory Committee, will develop a work plan for the update, conduct

research and review relevant documentation, determine hazards to be included in the 2030 AHMP, and begin the process to draft an updated AHMP.

- **Plan Submission and Adoption:** Once updated, the plan is submitted to Cal OES and FEMA for review. Upon conditional approval, it must be adopted by the Los Angeles County Board of Supervisors and participating jurisdictions to maintain eligibility for FEMA Hazard Mitigation Assistance (HMA) grants.

8.5 Integration with Other Plans

Los Angeles County is committed to ensuring that hazard mitigation planning is not a standalone effort, but a fully integrated component of broader County planning initiatives. By strategically weaving the goals, objectives, and actions of the All-Hazards Mitigation Plan (AHMP) into a variety of local and regional plans such as the General Plan, Capital Improvement Plans, Climate Action and Adaptation Plans, and departmental strategic plans; the County promotes a more cohesive and effective approach to building long-term resilience. This integration is achieved through ongoing collaboration with County departments, cities, and regional agencies to align land use, infrastructure development, and emergency preparedness efforts with identified hazard risks. Embedding hazard mitigation principles into existing policies and planning mechanisms ensures that they become an inherent part of decision-making processes, project funding prioritization, and long-term investment strategies ultimately reducing vulnerabilities and enhancing the resilience of communities across Los Angeles County.

The Los Angeles County AHMP will be shared across all jurisdictions within the operational area. Those jurisdictions will have the opportunity to incorporate the 2025 AHMP into their established planning process. The Hazard Mitigation Advisory Committee will assess the plan at a yearly basis, acknowledging the dynamic nature of hazard landscapes and the evolving understanding of risks. The OEM Hazard Mitigation Program will make the AHMP available for all county departments to incorporate into departmental planning efforts, and other relevant documents produced by Los Angeles County departments.

9 Plan Adoption

9.1 Plan Adoption Overview

Plan Adoption addressed Element F of the Local Mitigation Plan Regulation Checklist under single jurisdiction plan requirement.

The Los Angeles County Board of Supervisors officially adopted the 2025 All Hazard Mitigation Plan (AHMP) through a formal resolution on September 9, 2025. A scanned copy of the resolution is included in Appendix F. The Los Angeles County Office of Emergency Management (OEM) will retain the resolution for its records, while copies will be submitted to both Cal OES and FEMA.

This Plan adoption completes the mitigation planning process and department agencies, stakeholders, and community's commitment to the goals and actions. It also recognizes the current planning process and acknowledges changes from the past five years and validates the priorities for hazard mitigation actions. It makes the community eligible for certain FEMA assistance that can fund some mitigation actions.

After being adopted by the Los Angeles County Board of Supervisors, the 2025 AHMP transitions into the implementation phase. The success of the plan hinges on the integrating its mitigation strategies and actions into the local plans and policies. The mitigation action items collectively establish a robust framework to guide the County's hazard mitigation strategies over the next five years. To ensure these strategies are effective, actionable and well aligned with the county's long term resilience goals, the Planning Advisory Committee has set clear objectives. Their prioritized approach focuses on seamlessly blending mitigation actions with current policies, plans, and emphasizing collaboration and coherence throughout.

Appendices