La Habra Heights County Water District

Water Emergencies: 562-697-6769

Local Hazard Mitigation Plan Update

La Habra Heights County Water District

October 6, 2025

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SECTION 1. INTRODUCTION

The Local Hazard Mitigation Plan (LHMP) update is a "living document" that should be reviewed, monitored, and updated to reflect changing conditions and new information. As required, the LHMP must be updated every five (5) years to comply with regulations and Federal mitigation grant conditions. In that spirit, this LHMP is an update of the La Habra Heights County Water Districts Hazard Mitigation Plan under review by FEMA.

1.1 Purpose of the Plan

Hazard mitigation intends to reduce and/or eliminate loss of life and property. FEMA defines hazard mitigation as "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." A "hazard" is defined by FEMA as "any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other loss."

The Local Hazard Mitigation Plan aims to demonstrate a plan for reducing and/or eliminating risk within the La Habra Height County Water District service area. The LHMP process encourages communities to develop goals and projects that will reduce risk and build a more disaster-resilient community by analyzing potential hazards.

After disasters, repairs, and reconstruction are often completed in such a way as to simply restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, restoring things to pre-disaster conditions sometimes results in feeding the disaster cycle: damage, reconstruction, and repeated damage. Mitigation is one of the primary phases of emergency management, specifically dedicated to breaking the cycle of damage. Hazard mitigation is distinguished from other disaster management functions by measures that make LHHCWD infrastructure development and the natural environment safer and more disaster resilient. Mitigation generally involves altering physical environments, significantly reducing risks and vulnerability to hazards by altering the built environment to avoid or reduce life and property losses. Mitigation also makes responding to and recovering from disasters easier and less expensive.

With an approved (and adopted) LHMP, the La Habra Heights County Water District is eligible for federal disaster mitigation funds/grants (Hazard Mitigation Grant Program, Pre-Disaster Mitigation, and Flood Management Assistance) aimed to reduce and/or eliminate risk.

1.2 Authority

In 2000, FEMA adopted revisions to the Code of Federal Regulations. This revision is known as “Disaster Mitigation Act (DMA).” DMA 2000, Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a Hazard Mitigation Plan that describes the process for assessing hazards, risks, and vulnerabilities, identifying and prioritizing mitigation actions, and engaging/soliciting input from the community (public), key stakeholders, and adjacent jurisdictions/agencies.

Senate Bill No. 379 will require the safety element to be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to the county upon the next revision of a local hazard mitigation plan on or after January 1, 2023, or, if the local jurisdiction has not adopted a local hazard mitigation plan, beginning on or before January 1, 2028.

La Habra Heights County Water District was established in 1976 and succeeded La Habra Heights Mutual Water Company. The Mutual Company was formed in 1919. The District serves water to 1,978 metered connections covering 6 square miles of land. Approximately 5,560 people are served by the district’s water system. The District occupies approximately 3,904 acres (about half the area of Chicago O'Hare airport), which includes much of the City of La Habra Heights, small portions of the City of Whittier, and unincorporated Los Angeles County in Southern California.

The District is governed by a five (5) member Board of Directors, elected at large, from the residents living within the LHHCWD service area boundaries. LHHCWD does not have legal authority for zoning, land use, new construction, planning, building inspections, or codes. LHHCWD will have to issue a “Will Serve” letter for any new development requested. The County of Los Angeles and the City of La Habra Heights have authority over building codes.

1.3 What’s New

The 2022 La Habra Height County Water District Local Hazard Mitigation Plan contained a detailed description of the planning process, a risk assessment of identified hazards for the service area, and an overall mitigation strategy for reducing the risk and vulnerability from these hazards. Since FEMA's approval of the plan, LHHCWD has made progress on the mitigation strategy. As part of this 2025 LHMP update, a thorough review and update of the 2022 plan was conducted to ensure that this update reflects current conditions and priorities to realign the overall mitigation strategy for the next five-year planning period. This section of the plan includes the following:

What's New in the Plan Update. This section provides an overview of the approach to updating the plan and identifies new analyses, data, and information included in this Plan update to reflect current service area conditions. This includes a summary of new hazard and risk assessment data related to the service area and information on current and future development trends affecting infrastructure vulnerability and related issues. The updated data and analyses are in their respective sections within this 2025 LHMP update.

Summary of Significant Changes to Current Conditions and Hazard Mitigation Program Priorities. This section summarizes significant changes in current conditions, changes in vulnerability, and any resulting modifications to the community's mitigation program priorities.

2022 Mitigation Strategy Status and Successes. This section describes the status of mitigation actions from the 2022 plan and indicates whether a project is no longer relevant or is recommended for inclusion in the updated 2025 mitigation strategy.

This *What's New* section provides documentation of the LHHCWD service area's progress or changes in their risk and vulnerability to hazards and their overall hazard mitigation program. Completing this 2025 LHMP update further provides documentation of the continued commitment and engagement in the mitigation planning process.

1.4 New Risk Assessment

As part of its comprehensive review and update of each plan section, LHHCWD recognized that updated data, if available, would enhance the analysis presented in the risk assessment and be utilized in developing the updated mitigation strategy. Highlights of new data used for this plan update are identified below in this section and are also sourced in context within *Section 4, Risk Assessment*. Specific data used is sourced throughout this plan document. This new data and associated analysis provided valuable input for developing the mitigation strategy presented in *Section 5* of this plan. A highlight of new information and analyses contained in this update plan includes the following:

- A new assessment of updated hazards affecting the LHHCWD service area was completed, adding additional hazards to planning documents. The new hazards include cyber security.
- An entire rework of the risk assessment for each identified hazard. This included reworking the hazard profile and adding new hazard event occurrences, rebuilding vulnerability as the whole analysis to add items identified below, and updating the vulnerability assessment based on more recent hazard data.
- An update of the flood hazard analysis will include an updated analysis of the 100-year flood and an analysis of the 500-year flood, including the new and updated DFIRMs.

- An enhanced vulnerability assessment.

Incorporation and analysis of the new 2020 Census data were utilized for this LHMP update. Census data was used in an intersect analysis to determine how much of the population is exposed to earthquakes, wildfire, drought, landslides, and windstorm hazards.

1.5 Successful Mitigation Implementation

LHHCWD has completed a review of past seismic retrofit studies and has applied studies to current and future projects.

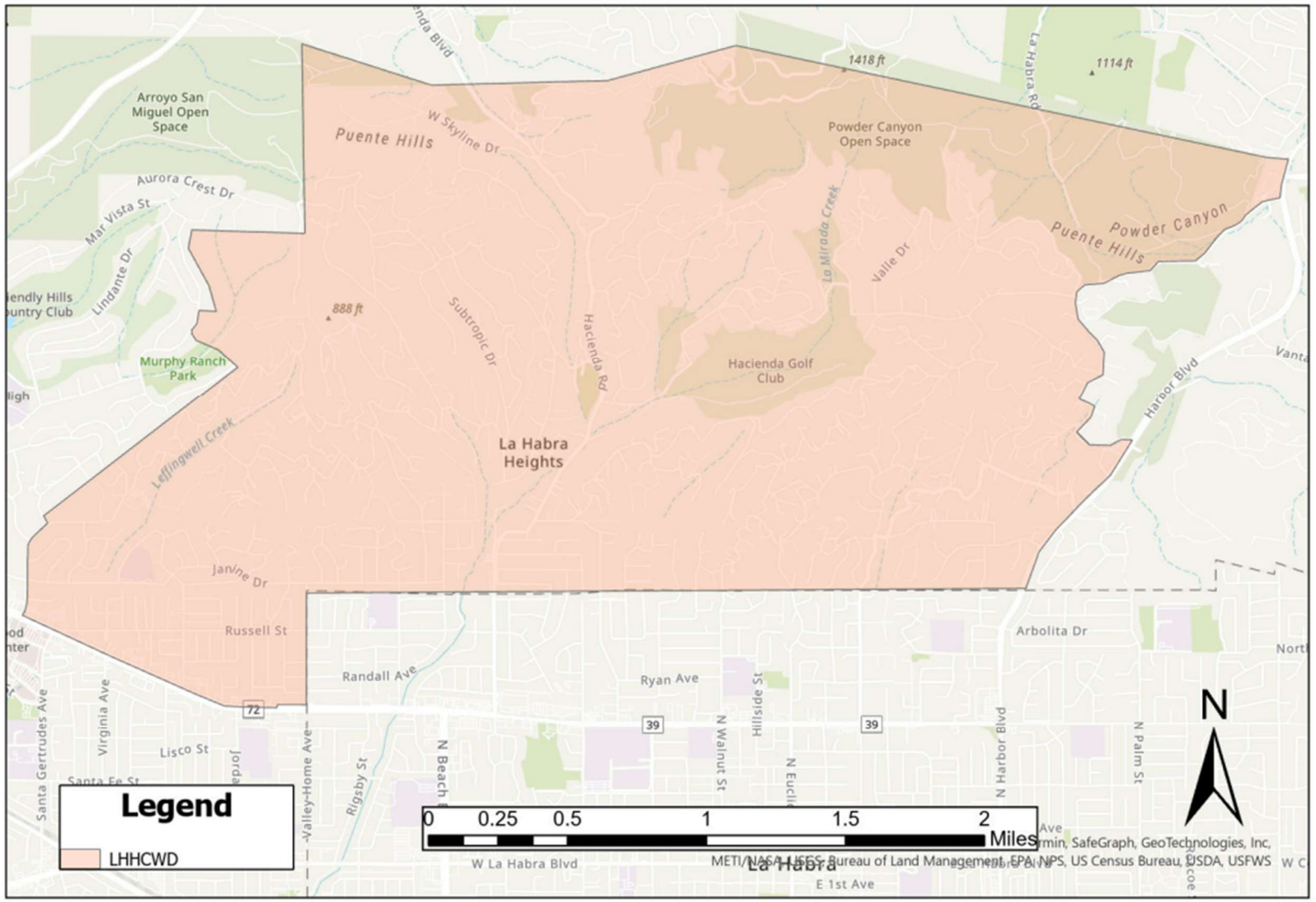
- One steel reservoir has been strategically retrofitted since 2020, and one more is planned for the next five years, 2025-2030.

1.6 Community Profile

Physical Setting

The District is located within the City of La Habra Heights and the County of Los Angeles. The service area is mostly open space with rolling hills, with very little flat land. The service area is also home to small horse properties and small avocado groves. The neighboring cities are Hacienda Heights, Whittier, La Habra, and Rowland Heights. The average rainfall for the area is approximately 13 inches per year. This area has a mild climate with average temperatures of a low 40 degrees in the winter and a high of 88 degrees in the summer months.

Figure 1. La Habra Heights County Water District Service Area Map



History

La Habra Heights County Water District is located approximately 15 miles east of the Pacific Ocean and is bordered by Whittier, La Habra, Hacienda Heights, and Rowland Heights. The zoning is 1-acre (4,046 m2) lots with a variety of home and ranch style properties. La Habra Heights features open space, no sidewalks, and encouragement of animal husbandry. La Habra Heights has no commercial activity (stores, gas stations) except for a small real estate office, a plant nursery, a private golf course, oil and gas operations, churches, the city offices, and long-term care facilities. The only park in the district is called “The Park” which runs along Hacienda Road.

The District located in the southwest section of Los Angeles County, CA, which is bordered by San Bernardino, Ventura, Kern and Orange Counties, and the Pacific Ocean on the west. Los Angeles County has a population of more than 10 million residents (about half the population of New York); it is the most populated County in the United States, with 88 incorporated cities and many unincorporated areas. The County covers 4,083 square miles (about the area of Connecticut). It is home to more than one-quarter of California’s residents and the most ethnically diverse County in the United States.

The water service area covers part of the City of La Habra Heights as well as a small area in the County of Los Angeles and the City of Whittier. When physical operations began in 1919, the Mutual Company served mostly avocado farmers and a small number of residents.

Currently, the District pumps water from the underground aquifer and distributes water to the customers. Besides the underground aquifer, the only other source is a connection to the Metropolitan Water District. The District serves a population of approximately 5,600 residents within a 6-square mile area and maintains approximately 1,978-meter services, 60 miles of pipeline, and 13.85 million gallons (about 52427928.5 L) of water storage capacity.

Table 1. LHHCWD Critical Facilities

Critical Facilities	Hazard Vulnerability
Well 8	Earthquake, Wildfire, Windstorms, Climate Change Induced Drought
Well 10 & 11	Earthquake, Wildfire, Windstorms, Climate Change Induced Drought
La Mirada Conduit under 605 freeway	Earthquake, Wildfire, Windstorms

Gualtieri Reservoir	Earthquake Wildfire, Windstorms
Plant 1	Earthquake, Wildfire, Windstorms
Plant 2	Earthquake Wildfire, Windstorms, Climate Change Induced Drought
Reservoir 5A	Earthquake Wildfire, landslides , Windstorms
Plant 5/Reservoir 2	Earthquake Wildfire, landslides, Windstorms
Plant 6/Lyons Reservoir	Earthquake Wildfire, landslides, Windstorms
Snooks Reservoir	Earthquake Wildfire, landslides, Windstorms
Vigil Reservoir	Earthquake Wildfire, landslides, Windstorms
Reservoir 10A	Earthquake Wildfire, landslides, Windstorms
District Office	Earthquake, Wildfire, landslides, Windstorms

1.7 Climate

The average rainfall[1] in La Habra Heights, where the Main Headquarters is located, has an average temperature ranging from 55.5 to 80.3 degrees Fahrenheit. The region's temperate Mediterranean climate fosters moderate winters, hot summers, and generally low humidity.

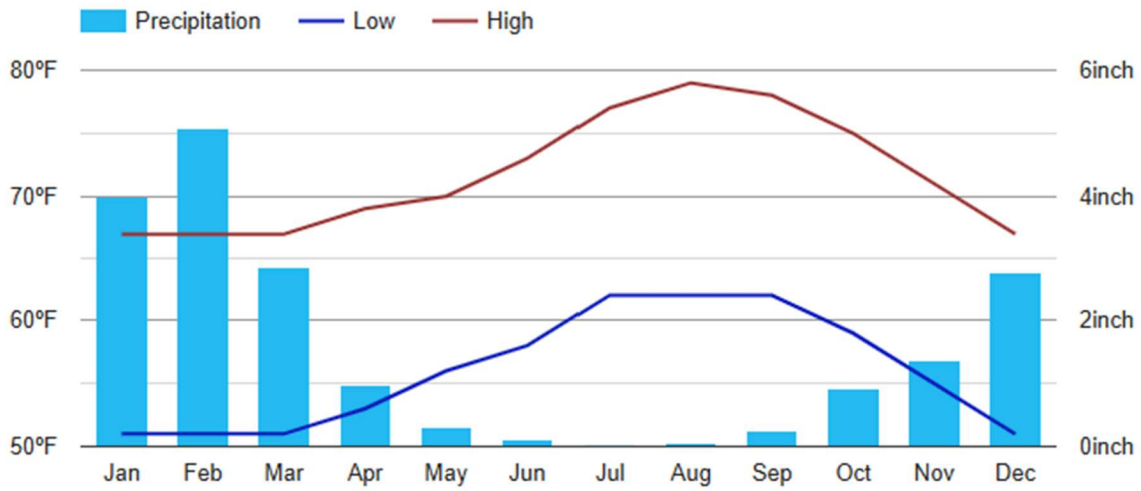
Table 2. Average Max and Min Temp and Total Precipitation for La Habra Heights

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Avg. Max. Temp (F)	68	70	75	77	79	89	93	95	92	83	73	69	80.3
Avg. Min. Temp (F)	45	47	51	53	57	62	67	67	66	58	49	44	55.5

[1] Average weather Los Angeles 2025 normal US Climate Data https://www.usclimatedata.com/

Avg. Total Precipitation	2.61	1.93	1.27	.73	.31	0	.23	.20	.53	.83	1.31	2.99	1.1

Figure 2. Average max and min climate graph



1.8 Demographics

Demographics for our service area are based on Census 2020[2]. The City of La Habra Heights has a population of approximately 5,600 people, with a density of 330.5 people per square mile. There are approximately 1,805 households in La Habra Heights. Ninety-three percent of the population lives in owner-occupied homes, and 7 percent of the population live in rented properties. The medium income is $118,000, with 3.4 percent living below the federal poverty line.

In emergencies, the City of La Habra Heights Fire Department services handles calls in the City Area and County of Los Angeles handles underserved communities and socially vulnerable populations. The city and surrounding county area are wealthy communities. LHHCWD does not serve a severely economically disadvantaged community based on the 2020 Federal Census.

[2] Service area population from http://datausa.io

Table 3. Percentage of the Population at Risk from Identified Hazards within

% of Population at Risk from Identified Hazards	LHHCWD	Population Total
Population within Service Area	5,600	5,600
Earthquake	100%	5,600
Drought	100%	5,600
Landslides	50%	2,800
Windstorm	20%	1,120
Wildfire	100%	5,600

1.9 Existing Land Use

The existing land use is housing, government (including a Park), light commercial, a golf club, and oil well sites. The City of La Habra Heights is responsible for land use. The District does not have the authority to regulate land use in the area. Incorporated areas are regulated by the City of La Habra Heights and the unincorporated areas by Los Angeles County.

1.10 Development Trends

City of La Habra Heights is mostly in a rural setting with some avocado groves, equestrian-friendly properties, and large homes in a hilly area. There are no large housing tracks under development in the service area. Home prices range from $875,000 to $4.5 million.

Building in this area does increase the vulnerability of hazards for the water system. This development means there are more pipelines, pumping stations, and automatic control valves, fire hydrants, water meters, storage reservoirs, and wells needed to supply services to the new area. The service area is also in a high-fire area and is vulnerable to earthquakes, landslides and intense high winds during the Santa Ana events. However,

there are no expected changes in all hazards, impacting current and future increased population patterns and development growth to the water system.

All future development that will take place is planned to occur in accordance with the unincorporated areas managed by the County of Los Angeles. The City and County will consider all potential hazards identified within this 2025 LHMP. Additionally, all developments will comply with all the county and state Fire, Flood, and Seismic codes at the time of development.

SECTION 2. PLAN ADOPTION

2.1 Adoption by Local Governing Body

After public review, the draft Local Hazard Mitigation Plan (LHMP) will be submitted to the La Habra Heights County Water District (LHHCWD) Board of Directors for adoption by resolution. The adopted LHMP and resolution will be forwarded to the California Office of Emergency Services (CalOES) for review. Upon CalOES approval, the LHMP will be sent to the Federal Emergency Management Agency (FEMA). The Board's resolution will incorporate any changes required by CalOES or FEMA. FEMA will issue an "Approval Letter" when the LHMP meets all federal requirements. A copy of the final LHMP will be delivered to the Los Angeles County Office of Emergency Management and retained by LHHCWD.

2.2 Promulgation Authority

The Local Hazard Mitigation Plan was reviewed and approved by the elected members of the La Habra Height County Water District's Board of Directors:

Brad Cooke - President

Pam McVicar. - Vice President

Karen Baroldi –Board of Directors Member

Mark Perumean - Board of Directors Member

James Crabb - Board of Directors Member

2.3 Primary Point of Contact

The Point of Contact for information regarding this LHMP is:

Joe Matthews General Manager
1271 N. Hacienda Road

La Habra Heights, CA 90631

562-697-6769

Consultant Primary Contact:

Gary Sturdivan, Project Lead

Sturdivan Emergency Management Consulting, LLC.

(909) 658-5974

GSturdivan@semcllc.com

SECTION 3. PLANNING PROCESS

3.1 Preparing for the Plan

LHHCWD developed a broad approach in preparation for updating the hazard mitigation plan. As an active participant in the County of Los Angeles's Multi-Hazard Multi-Jurisdictional Mitigation Plan, LHHCWD used county-provided resources to assist in developing and evaluating data to start the plan update.

Internally, LHHCWD has a wealth of experienced and resourceful employees who benefit from the program. The LHHCWD team participated in regular discussions and staff meetings supporting the plan update. The internal planning team was invited to the meeting through email and Zoom Meetings and Microsoft Outlook calendar invites.

In addition, the General Manager contacted the following, by phone and email. All the following were invited to take part in planning or review the LHMP. Additionally, members from local government agencies who were asked to be a part of the LHHCWD LHMP Update Planning team to assist in document review included staff from La Habra Heights Fire Department who was able to attend. Los Angeles County Fire Department, Los Angeles County OES, the Los Angeles County Office of Emergency Management, and the Los Angeles County Sheriff Department were unable to join at this time. This team also participated in community outreach with local businesses, including community-based organizations, that work directly with and/or provide support to underserved communities and socially vulnerable populations and members of the public. The Neuro Restorative care facility in La Habra Heights is an organization within the service boundaries that conduct outreach and assistance for vulnerable populations was asked and agreed to involvement of reading and comments of the LHMP. Other Organizations include the American Red Cross, churches in the area, The Heights Inn assisted living home, and the Partnership for Inclusive Disaster Strategies. Unfortunately, these organizations were unable to join at this time. La Habra Heights Fire Department attended meetings and was contacted by the Geneal Manager of LHHCWD.

LHHCWD is a member of CalWARN and PWAG. The service area and surrounding area are wealthy communities and doesn't have a at risk population.

- LHHCWD's approach in updating the plan consisted of:
- Establishing the internal planning team
- Coordination with outside agencies, organizations, jurisdictions, and the public
- Documenting past events
- Posting the meeting agendas, and draft LHMP onto their website and asking for public input and comments on the planning process

- Conducting public outreach
- Reviewing and updating the hazards
- Reviewing and updating mitigation measures
- Plan Adoption

During the planning process, the Planning Team utilized the following plans to gain information on the service area hazards and mitigation goals for LHHCWD. Relevant information from each of the following plans, including local and County Government priorities, was included when aligned with LHHCWD strategies and projects and incorporated into this update. There have not been any changes in priorities since the approval of the 2021 LHMP.

LHHCWD is not required to have an Urban Water Master Plan as LHHCWD is under 3,300 service connections. LHHCWD does have a Water Master Plan, in which it includes community water systems, water storage, water shortage, and climate change within the district.

Table 4. Plans Used

Study Plan	Key Information
2022 Water Master Plan	Water Systems
2022 LHHCWD LHMP	Hazard Identification, Mitigation Measures
2020 Los Angeles County LHMP	Hazard Identification, Mitigation Measures
2025 California HMP	Land Use for Area, Future Projects
Los Angeles County Flood Control	Goals For the State of California

The planning process consisted of:

3.2 Planning Team

As identified in **Section 3.1**, several planning teams were associated with preparing the update. The Hazard Mitigation Plan was compiled and authored by members of the following Planning Team:

Internal Team:

Joe Matthews- General Manager

Ivan Ramirez - Superintendent

Karen Baroldi – Director, Board of Directors

External Team:

Ryan Jorgensen – La Habra Heights Fire Department Battalion Chief/Paramedic Coordinator

Frank Salazar – City of San Bernardino Municipal Water Department

Ed Castenda - Orchard Dale Water District

3.3 Coordination with Other External Jurisdictions, Agencies, and Organizations

The Internal and External Planning Teams include three people from the La Habra Height County Water District and four people from local agencies. The City of La Habra Heights

Fire Department, City of San Bernardino Municipal Water Department, and Orchard Dale Water District. The Neuro Restorative care facility in La Habra Heights is an organization within the service boundaries that provide assistance for vulnerable populations was asked and agreed to involvement of the LHMP. Los Angeles County Fire Department, Los Angeles County OES, Los Angeles County Office of Emergency Management, Los Angeles County Sheriff, local churches and American Red Cross, The Heights Inn assisted living home, and the Partnership for Inclusive Disaster Strategies were invited to be on the Planning Team, but no one attended. Orchard Dale Water District and City of San Bernardino Municipal Water Department chose to only review the final document for content. The meeting matrix outlining the subjects covered and the attendees is in Appendix A.

The Planning Team participated in monthly meetings to coordinate efforts, provide input, and receive support for the LHMP. The support included receiving technical expertise, resource materials, and tools. LHHCWD facilitated the LHMP process and provided information that follows FEMA requirements for the program. The tools, resource materials, and other project-related information are maintained on a project portal on LHHCWD's website which allows access to the information by all participants and the public; screenshots are located under Appendix B.

Mr. Gary Sturdivan's contact information was on each document for questions and concerns. The Planning Team reviewed the document and made corrections or voiced concerns to the consultant. These comments were discussed at the next team meeting, and corrections were then made to the document. These meetings were not publicly held.

Accomplishing a shared goal for emergency preparedness and hazard mitigation requires the coordinated efforts of various jurisdictions, agencies, and organizations.

This team's objective consisted of:

- Assisting all participating jurisdictions with the Hazard Mitigation Plan planning process
- Guiding the CalOES and FEMA requirements
- Assisting in the development of regional maps and supporting information regarding hazards
- Providing a forum to all jurisdictions participating in the update for questions and issues to be discussed

The La Habra Height County Water District Planning Team participated in each of the scheduled Planning Team meetings and conference calls facilitated by SEMC related to the update project. Meeting agendas discussing LHMP updates are in Appendix A.

3.4 Public Involvement/Outreach

In support of the La Habra Height County Water District LHMP update, LHHCWD solicited information from members of the public through various methods. LHHCWD conducted their outreach through, email, phone calls and the General Manager attend face to face meetings with posting sections of the draft LHMP onto the La Habra Height County Water District website. Outreach to nonprofit organizations, including community-based organizations and the agencies listed in **Section 3.1**, was conducted to allow those representing vulnerable populations to be involved in the planning process. LHHCWD outreach included a solicitation for comments through phone calls and emails to the organizations in Section 3.1 on numerous occasions but could not elicit feedback.

These methods consist of:

- Community Outreach events
- External Agencies Local Emergency Coordination Meetings

Plan/Project inclusion in the La Habra Height County Water District's Programs includes mitigation actions that require public involvement and are open for public comment. (Capital Improvement Plan, Annual Budget Report, etc.)

Any information and public feedback collected from the public outreach phase, public events, and meetings will be documented in **Appendix B**, including outreach to representatives of the underserved and vulnerable populations who were provided the opportunity to be involved. **No comments were made at this time.**

3.5 Assess the Hazard

A critical component of the LHMP process is assessing the likely hazards that may impact LHHCWD facilities and operations. It is important to have a thorough understanding of these hazards without overanalyzing remote or highly unlikely hazards.

This LHMP has been developed through an extensive review of available information on hazards LHHCWD has faced in the past and most likely will face in the future. The Planning Team reviewed and discussed items that have happened in the State of California and disasters that have happened in the service area and Southern California. The Team reviewed documents such as engineering drawings, photographs, and available geotechnical and geologic data from the Internet and outside sources such as FEMA Hazard Mapping, Los Angeles County hazard maps, and documents.

Additionally, for each profiled hazard, the Planning Team then analyzed the community's exposure to each hazard (inventory of assets) and the potential impact under scenario events. The Planning Team used HAZUS, and hazards intersect analyses recently

completed within Los Angeles County to produce this information. *See Section 4 for more information.*

3.6 Set Goals

The goal-setting process for the 2025 Local Hazard Mitigation Plan update consisted of the Planning Team reviewing the hazard exposure and scenario impacts developed during the Risk Assessment portion of the process. With an understanding of the potential risk the community is facing, the Planning Team then re-evaluated the 2021 Hazard Mitigation Plan Goals and Objectives, assessed their status and effectiveness in meeting the 2021 Mitigation Measures, and identified new Goals and Objectives.

3.7 Review and Propose Mitigation Measures

Identifying mitigation measures began with reviewing and validating the previous mitigation measures in the La Habra Height County Water District 2021 Local Hazard Mitigation Plan. Using the existing plan as a starting point, the planning team assessed whether the measures were valid. Through this discussion, the development of new mitigation measures was determined.

The planning team identified and analyzed mitigation measures for the hazards that influence LHHCWD. This analysis assisted in developing an implementation strategy for prioritizing mitigation measures. Meetings (in-person and virtual) were held with the planning team as a group and through meetings within their departments to solicit input on the plan updates.

A wide variety of mitigation measures that can be identified to help reduce the impact or the severity of damage from hazards was examined. The projects were identified to help implement the Planning Team's goals and objectives. The following categories were used in the review of possible mitigation measures:

1. Public Information and Education - Outreach projects and technical assistance.
2. Structural Projects - Detention basins, reservoirs, road, and bridge improvements
3. Property Protection - Acquisition, retrofitting
4. Emergency Services - Warning, sandbagging, road signs/closures, evacuation
5. Natural Resource Protection - Wetlands, protection, best management practices.

In addition to the STAPLEE methodology, each Planning Team incorporated other criteria/factor questions into the process to help engage and solicit input from members. The STAPLEE method was applied to prioritizing the chosen mitigation actions.

Based on STAPLEE, the Planning Team addressed the following questions to determine mitigation options:

Does the Action:

1. Solve the problem
2. Address Vulnerability Assessment?
3. Reduce the exposure or vulnerability to the highest priority hazard
4. Address multiple hazards?
5. Address more than one (1) Goal/Objective?
6. Benefits equal or exceed costs?

Can the Action:

1. Be implemented with existing funds?
2. Be implemented by existing state or federal grant programs?
3. Be completed within the 5-year life cycle of the LHMP?
4. Be implemented with currently available technologies?

Will the Action:

1. Be accepted by the community?
2. Be supported by community leaders?
3. Adversely impact segments of the population or neighborhoods.
4. Result in legal action such as a lawsuit?
5. Positively or negatively impacts the environment.

Is there:

1. Sufficient staffing to undertake the project?
2. Sufficient funds to complete the project?
3. Existing authority to undertake the project?

After going through this process for each project, the Planning Team had the ability to identify the higher priority projects.

3.8 Draft the Hazard Mitigation Plan

The LHMP update was drafted by SEMC, the Project Lead, based on input and comments from the Planning Team. As indicated previously, the Planning Team used the 2021 LHMP as a starting point but revised it to reflect updated information.

The LHHCWD consultant led the Planning Team and prepared the draft LHMP with input from the Planning Team, local agencies in the area, and the public. The Planning Team reviewed and commented on the draft LHMP, and subsequent changes were made before the LHMP was finalized and adopted by the Board of Directors. All draft documents were posted on the La Habra Height County Water District website. Notices were sent to all water customers in the service area. billing statements and public updates on social media that LHHCWD has at its disposal. All LHMP documents were posted on the website, and comments were asked for. The LHMP was reviewed in comparison to the FEMA-designed Review Tool. The Review Tool links the federal requirements, identifies the sections in the LHMP where the information can be found, and provides a rating as to the level of compliance with the federal regulations.

Once the LHMP update was drafted, the Planning Team finalized the plan and forwarded it to Cal/OES and FEMA for approval.

3.9 Adopt the Plan

After public review, the draft Local Hazard Mitigation Plan (LHMP) will be submitted to the La Habra Heights County Water District (LHHCWD) Board of Directors for adoption by resolution. The adopted LHMP and resolution will be forwarded to the California Office of Emergency Services (CalOES) for review. Upon CalOES approval, the LHMP will be sent to the Federal Emergency Management Agency (FEMA). The Board's resolution will incorporate any changes required by CalOES or FEMA. FEMA will issue an "Approval Letter" when the LHMP meets all federal requirements. A copy of the final LHMP will be delivered to the Los Angeles County Office of Emergency Management and retained by LHHCWD.

SECTION 4. RISK ASSESSMENT

The goal of mitigation is to reduce the future impacts of a hazard, including property damage, disruption to local and regional economies, and the amount of public and private funds spent for recovery. Mitigation decisions are based on risk assessments where the probability of an event is evaluated with respect to the anticipated damages caused by such an event.

This section aims to understand the hazards and their risks in the La Habra Heights County Water District service area. This process generally has four steps: 1) Hazard Identification, 2) Vulnerability Analysis, 3) Risk Analysis, and 4) Vulnerability Assessment, clouding an estimation of potential losses. These are four items; however, the terms can be used interchangeably.

4.1 Hazard Identification

The Planning Team discussed potential hazards and evaluated their probability of occurrence. The following sections describe this process and the results.

4.2 Hazard Screening Criteria

Screening the hazards aims to help prioritize which hazards create the greatest concern for LHHCWD. A list of natural hazards to consider was obtained from the Federal Emergency Management Agency's (FEMA) State and Local Mitigation Planning How-to Guide: Understanding Your Risks (FEMA 386-1). The team used the Stafford Act, the California Emergency Service Act, and STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental feasibility) criteria to help rank each risk. The risks were ranked from 1 – 4, with (1) being a "Highly Likely" event, (2) being a "Likely" event, (3) being a "Somewhat Likely" event, and (4) being a "Least Likely" event. The Planning Team reviewed each hazard on the list using their experience and historical data pertaining to each hazard and developed the following ranked list in **Table 5**.

Table 5. Hazard Risk Rankings

Hazard	Risk Ranking (1-4)
Earthquake	1
Wildfire	1
Landslides	3
Windstorms	4
Climate Change Induced Drought	4

The natural hazards considered not to affect or be a risk to the District were ranked 4, "Least Likely," and not considered applicable to LHHCWD for mitigation. The hazards not used are tsunami, as the District is 20 miles inland from the nearest Ocean. Hurricanes and tornadoes are unlikely events in Southern California. Additionally, there are no active volcanoes in the region.

Hazard Assessment Matrix

LHHCWD used a qualitative ranking system for the hazard screening process, which generated a high/medium/low rating for the probability and impact of each screened hazard.

Probability Ratings: Highly Likely (1), Likely (2), or Somewhat Likely (3)

Impact Ratings: Catastrophic, Critical, or Limited

Screening Assessment Matrix

The screening assessment matrix was used to assess LHHCWD's hazards. The hazards have been placed in the appropriate cell of the corresponding "Screening Assessment Matrix" based on the Planning Team's collective experience. The hazard screening assessment is shown in **Table 6**. Prioritization of hazards is discussed in the following

section. The Probability/Impact rating is based on a 5-year occurrence. The percentages represent the likelihood within the 5-year occurrence.

Table 6. Screening Assessment Matrix

		Impact		
Probability	**Probability/Impact Rating**	**Catastrophic**	**Critical**	**Limited**
	Highly Likely (1) (75-100%)	Earthquake Wildfire		
	Likely (2) (50-75%)			Landslides
	Somewhat Likely (3) (25-50%)			Windstorms Drought

4.3 Hazard Profiles

This section looks at all the hazards identified by the Planning Team that may impact LHHCWD within its boundaries. This section gives an overview of each hazard, the definition of each hazard, the location of each hazard, and a description of how each hazard is expected to affect LHHCWD's service and/or service area using observed hazards in LHHCWD's service area, the hazards identified in the FEMA website, and the FEMA software program known as HAZUS (Hazards United States). HAZUS contains models of natural disasters and the effects the disasters can have on a region.

4.3.1 Wildfire

Probability: (75-100%) Highly Likely—Historical Wildfire data for LHHCWD and its region indicate at least four significant wildfires within the last five years. This equates to wildfire within their service area every 1.5 year or a 66.67 percent chance of wildfire in any given year. Based on this data, combined with La Habra Heights' Mediterranean climate, prolonged droughts, exposure to Santa Ana winds, and the potential for increased fire frequency and intensity due to climate change, LHHCWD determined that future wildfire occurrence within or near their boundaries is highly likely. This section evaluates all hazards affecting the District within its boundaries, as identified by the Planning Team.

Impact: Catastrophic

Priority: Highly Likely

General Definition: A wildfire is any fire occurring in a wildland area (i.e., grassland, forest, brushland) except for fire under prescription or control fire undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters. Wildfires are part of the natural management of forest ecosystems but may also be caused by human factors.

Nationally, over 80 percent of forest fires are started by negligent human behavior, such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause of wildfires is lightning. Downed utility poles or power lines are also a common cause of wildfires.

There are three classes of wildland fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildland fires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards (such as tornadoes, severe winds, etc.) increase the probability of wildfires by producing fuel in urban and rural settings.

Cyclical climate events, such as El Niño-La Niña, can also have a dramatic effect on the risk of wildfires. Fewer fires are typically seen during El Niño (when more rain is present), and larger, more frequent fires are typical during La Nina events.

California is highly susceptible to wildfires, especially during the fall and summer. Southern California experiences Santa Ana winds that develop primarily in the late summer and fall seasons. These winds are known for their high speeds and drying effect, which turn the natural grasses brown and dry. These winds are also capable of blowing down power lines that can start fires in the mountains and hills. The high winds drive the fires and can become large events that destroy large areas, including towns and cities, and cause loss of life and millions of dollars in property damage. In the jurisdictional boundaries, brush fires are known to jump from place to place due to patches of vegetation and winds. The Santa Ana winds are known to cause or spread wildfires.

Climate Change Probability: The probability of heightened wildfire activity resulting from climate change is significant, as drought conditions intensify dryness in the service area. Consequently, there is a higher risk of flooding as wildfires become more prevalent, with dry vegetation exacerbating the situation. It is well-documented that large wildfires can lead to substantial flooding, as the burning of vegetation removes natural barriers.

Climate Change Impacts:

The following summarizes changes in exposure and vulnerability to the wildfire hazard resulting from climate change:

Population—Climate change impacts on wildfire hazard may increase population vulnerability. Evacuations and displacement may occur due to wildfire risks and the safety of the public.

Critical facilities—Climate change impacts on the wildfire hazard may increase the exposure and vulnerability of all critical facilities.

Vulnerability & Impact: Wildfire events can harm people throughout the LHHCWD service area but have a greater effect on the safety of people experiencing homelessness and those working outdoors. Severe wind events may impact populations that work outside or have respiratory illnesses as they can spread smoke, ash, and other contaminants that can affect the health of residents and workers. Lower-income residents, who may not have the financial resources to purchase homes (or are renting homes) that are not built or retrofitted to withstand powerful winds, could also have difficulty protecting themselves from polluted air quality.

Description: Local facility fires are a significant concern. The District's office facilities, computer systems, SCADA system, and operating pump stations and reservoirs are susceptible to fire damage. The consequences include loss of life, buildings, equipment, and property damage.

California is very susceptible to wildfires, especially during the fall and summer. Southern California has Santa Anna winds that develop primarily in the late summer and fall. These winds are known for their high speeds and drying effect, which turn the natural grasses brown and dry the southwest natural vegetation. These winds can also blow down power lines known to start fires in the mountains and hills. The high winds drive the fires, and the fires become large events that destroy large areas within cities and towns and cause millions of dollars in damage to property and loss of life.

Wildfires affect the District in various ways. During large wildfires, firefighting personnel may draw large amounts of water and strain the water supply system. The fires also burn through electrical power lines, and the District can lose power in critical areas. Without power, the District cannot pump groundwater from the aquifer or pump additional water to needed areas.

Figure 3. Wildfire Map with LHHCWD Boundaries

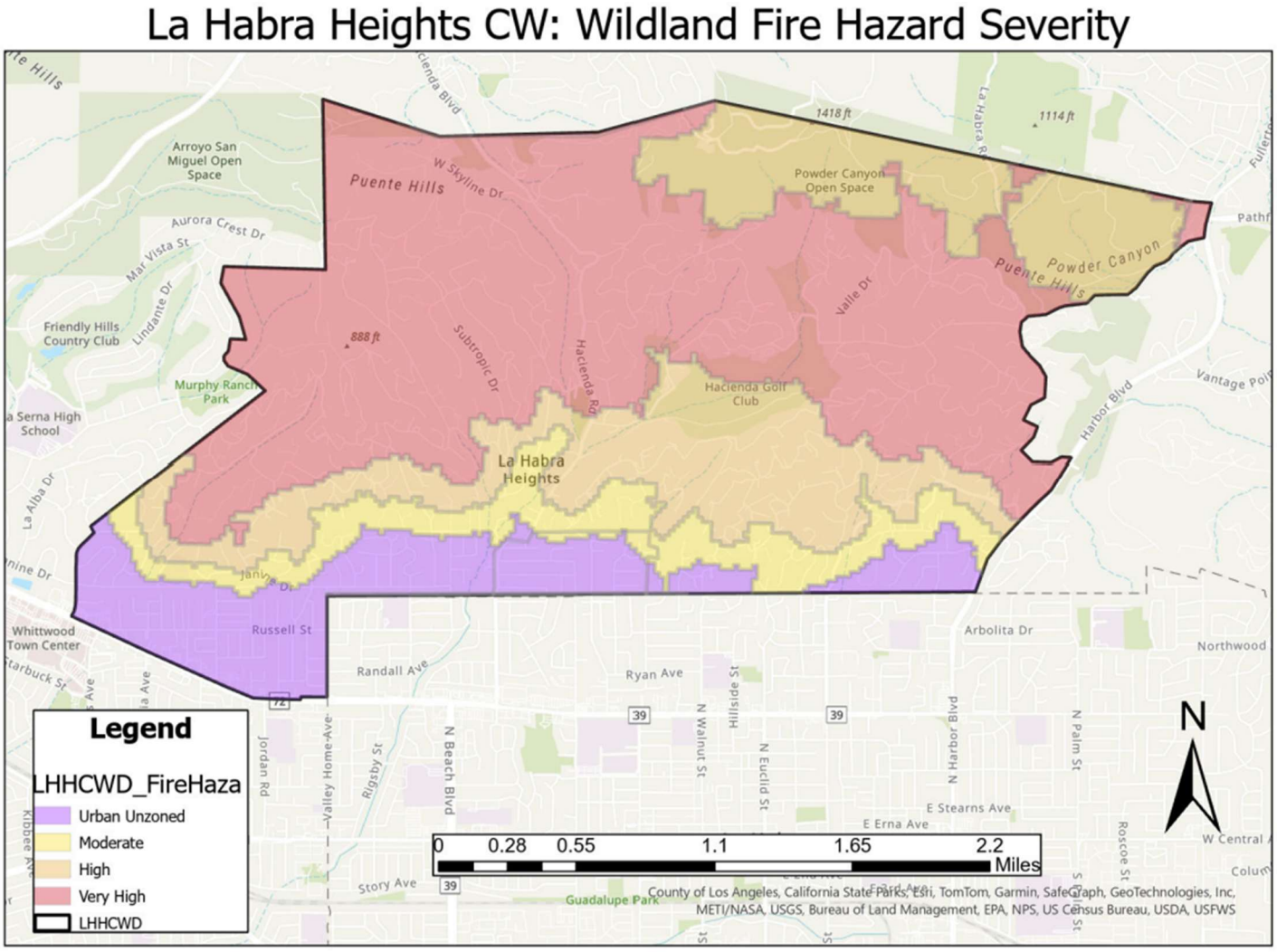


Table 7. 2020-2025 Significant Wildfires History in Los Angeles County

Fire Name	Date	Acres Burned
Bobcat Fire	2020	115,796
El Dorado Fire	2020	22,744
Palisades Fire	2025	23,713
Eaton Fire	2025	14,117

*Wildfires burning ≥10,000 acres or destroying ≥1,000 structures, based on Cal Fire's criteria for major incidents

Within the 2020 - 2025 timeframe, there was two federal and/or state declaration declared for California wildfires within the LHHCWD service area. Notice is hereby given that, in a letter dated October 16, 2020 (DR-4569-CA), and January 8, 2025 (DR-4856-CA) the President issued a major disaster declaration under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 *et seq*. (the "Stafford Act"), as follows:

> *"I have determined that the damage in certain areas of the State of California resulting from wildfires beginning on [September 4, 2020 (DR-4568-CA) / January 7,2025 (DR-4856-CA)], and continuing, is of sufficient severity and magnitude to warrant a major disaster declaration under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq. (the "Stafford Act"). Therefore, I declare that such a major disaster exists in the State of California."*

Impact Statement: Wildfire events have the potential to cause a variety of impacts on LHHCWD and its assets. Wildfires could directly damage above-ground assets that are burned or melted by fires. In addition, wildfires have the potential to cause damage to underground pipes in domestic water systems, as demonstrated in Santa Rosa, where heat from a wildfire melts underground pipes, causing benzene to leech into the water supply. Wildfires may also impede access to assets that need maintenance or repair or pose life safety threats to employees. LHHCWD will also need to supply water to fight fires, which could impact the available supply.

In addition, wildfires have the potential to result in indirect or cascading hazards to LHHCWD. If utility lines are damaged, wildfires can cause power outages, and burned areas are much more susceptible to landslides.

A power outage has the potential to disrupt services provided in the service area. LHHCWD relies on an adequate energy source to power many of its assets, including booster stations, water treatment plants, and any other asset that requires an electrical component. LHHCWD has portable backup power supplies for many of its critical assets to minimize the impacts of power outages. However, long-term outages may exceed the fuel required to power backup generators. This could compromise nearly all the services, including domestic water delivery, water treatment, and irrigation. Administrative buildings also require an energy source, and disruptions could compromise operations, billing, and communications. A loss of power resulting in the inability of LHHCWD to provide essential services could have direct impacts in terms of revenue loss and reputational impacts, in addition to far-reaching community impacts.

In summary, the entire service area, including all current and future assets (infrastructure, buildings, critical facilities, and population), is considered at risk of wildfire events. All current and future above-ground assets, drinking water systems, and populations (e.g., employees) are at most risk of wildfire. LHHCWD has no jurisdiction over land use, development and zoning, socially vulnerable populations, and/or land development within their service area. Water districts nationwide follow the standards set by the American Water Works Association and USEPA governing public water systems.

4.3.2 Earthquake

Probability: (75-100%) Highly likely – Historical earthquake data for LHHCWD and its region indicate 6 significant (magnitude 4.0 or higher) earthquakes within the last 5 years. However, some earthquakes in southern California occur daily but are insignificant to LHHCWD. This equates to a significant earthquake every 1 year on average or a 100 percent chance of a significant earthquake in any given year. Based on this data, LHHCWD determined that future earthquake occurrence within their boundaries continues to be highly likely. This section looks at all the hazards affecting the district within its boundaries, which the Planning Team identified.

Impact: Catastrophic

Priority: Highly Likely

General Definition: An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the earth's surface. The plates move slowly over, under, and past each other to create mountains, valleys, and all other geological formations. Usually, the movement is gradual; however, increased movement occurs when the plates become locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free, causing the ground to shake. Most earthquakes occur at the boundaries where plates meet; however, some earthquakes occur in the middle of plates.

Ground shaking from earthquakes can collapse buildings and bridges and disrupt gas, electricity, water utilities, and phone service. Additionally, earthquakes can trigger landslides, avalanches, fires, and destructive ocean waves such as tsunamis. Buildings with foundations resting on unconsolidated fill material and other unstable soil, as well as homes not tied to their foundations, are at risk because they can be shaken off their mountings even during a mild earthquake. An earthquake in a populated area may cause deaths, injuries, and/or extensive property damage.

Earthquakes strike suddenly and without warning at any time of year. On a yearly basis, 70 to 75 damaging earthquakes occur worldwide. Estimates of losses from a 7.8-magnitude earthquake in the southern section of the San Andreas Fault System (located in the regional area near Los Angeles County) could easily reach $200 billion in damages. This information was pulled from the California Great ShakeOut© USGS scenario.

Earthquakes pose a moderate to very high risk for 45 states and territories in the United States of America, and earthquakes occur in every region of the Country. California experiences the most frequent damaging earthquakes of the 45 states and territories of the United States; however, Alaska experiences the greatest number of large

earthquakes, most located in uninhabited areas. The nearby southern section of the San Andreas Fault is ranked in the top five (5) most likely faults to cause major damage in the United States by the United States Geological Survey (USGS).

The source for the earthquake profile is a report that describes a new earthquake rupture forecast for California developed by the 2007 Working Group on California Earthquake Probabilities (WGCEP 2007). The Earthquake Working Group was organized in September 2005 by the USGS, the California Geological Survey (CGS), and the Southern California Earthquake Center (SCEC) to understand the locations of faults in California better. The group produced a revised, time-independent forecast for California for the National Seismic Hazard Map.

Climate Change Impacts: The following summarizes changes in exposure to earthquake hazards resulting from climate change.

Population – Vulnerability to earthquakes is unlikely to increase due to climate change.

Critical facilities – All critical facility's exposure and vulnerability are unlikely to increase due to climate change.

Vulnerability: The socially vulnerable population comprises individuals such as children, the elderly, individuals with mental health challenges, and those facing financial hardship. These individuals may reside in unconventional living situations, such as under bridges, tents, or makeshift shelters along waterways or freeway bridges. The socially vulnerable populations are most susceptible based on many factors, including how the people respond to their financial ability to purchase supplies. Food, clothing, and safe housing may be manageable for only short periods and then fall into extreme poverty, with a lack of resources and the ability to navigate special needs in an emergency or to manage to obtain adequate food, housing, clothing, or medical treatment.

In an earthquake, vulnerable populations may not be able to find adequate shelter as the landscape streets and shelters are not available in the short term. Shelter must be developed and put in place by the affected cities, counties, States, or FEMA.

Table 8 below is a replacement cost estimate for all LHHCWD critical facilities.

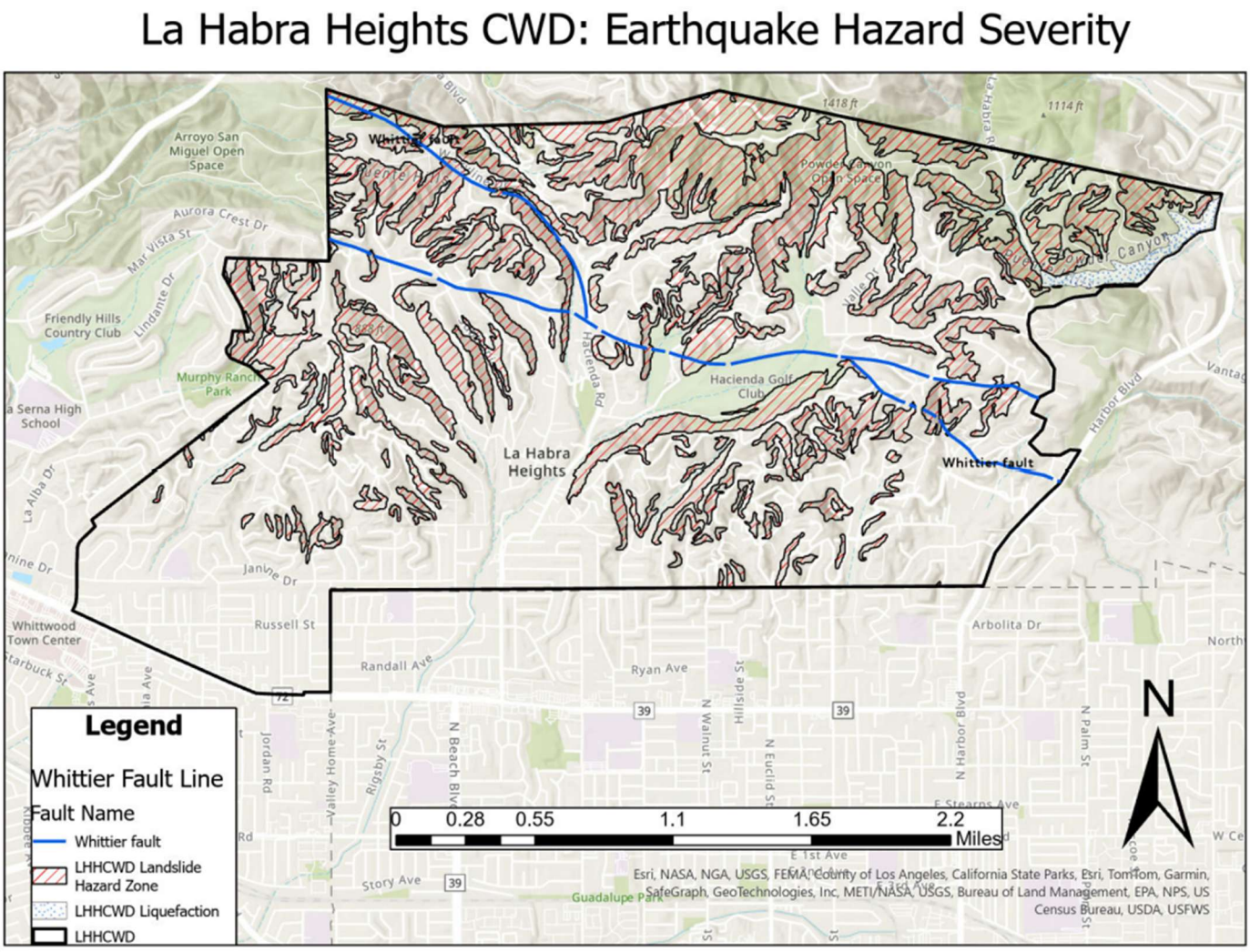
Table 8. Earthquake Replacement Costs

LHHCWD / Earthquake Magnitude	Replacement Value
Magnitude 7.0 or Above (Very High Impact)	
LHHCWD – All Critical Assets	$67,300,000
Magnitude 5.0 or 6.9 (Moderate Impact) – 80%	
LHHCWD – All Critical Assets	$53,840,000
Magnitude 1.0 or 4.9 (Low Impact) – 0%	
LHHCWD – All Critical Assets	$0

Description: The area around LHHCWD facilities is seismically active since it has the Whittier fault line through it. There have been many earthquakes in and around the District's service area.

The greatest earthquake threat in the United States is along tectonic plate boundaries and seismic fault lines in the central and western states; however, the Eastern United States faces a moderate risk of less frequent, less intense earthquake events.

Figure 4. Earthquake Map with LHHCWD Boundaries



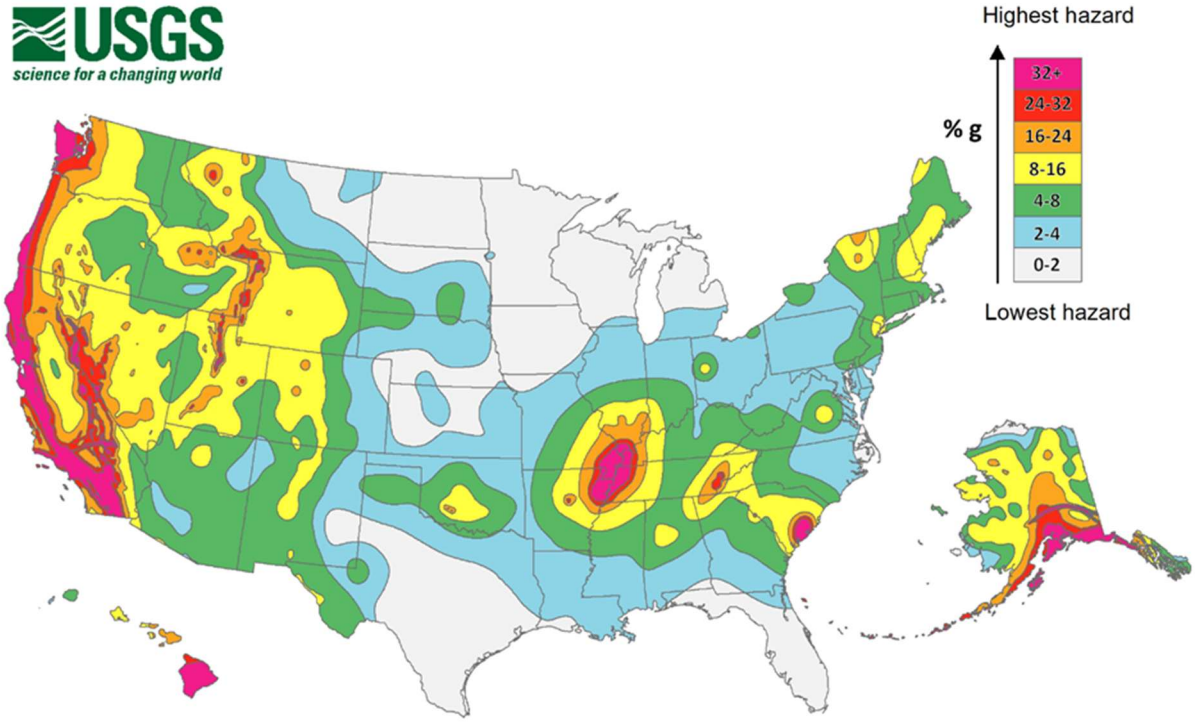


Table 9. Significant Earthquakes (4.0+ Mw) within Los Angeles County

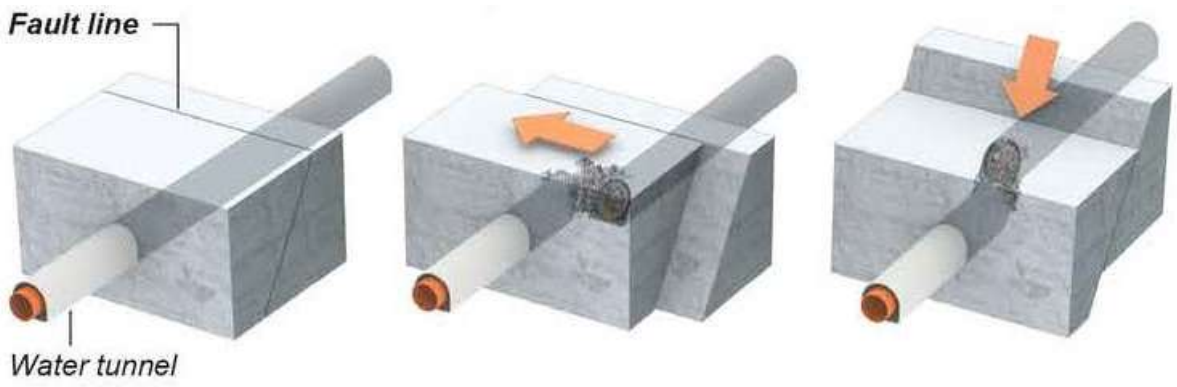
Date	Area	Mag (M_w)	Total Damage to LHHCWD
April 4, 2020	Inglewood	4.0	None
June 3, 2020	Hollywood Hills	4.0	None
July 30,2020	San Pedro	4.2	None
August 12, 2024	El Sereno	4.4	None
September 12, 2024	Malibu	4.7	None
March 9, 2025	Malibu	4.1	None

Within the 2020 - 2025 timeframe, there were no federal and/or state declarations declared for earthquakes within the LHHCWD service area.

Impact Statement: A significant earthquake could have devastating impacts on LHHCWD and its assets. Shaking during earthquakes can cause structural failures, while ground displacement and liquefaction can cause infrastructure to sink, sag, float, rupture, or sever completely. Access to all assets may be restricted if the roads necessary for accessing them are in a state of disrepair and unable to be traversed. An extended loss of power or widespread damage to a system could impair the District's ability to provide service, especially if generators are compromised. This could, in turn, lead to a loss of service and revenue for a time while costly repairs are being made. Fires following earthquakes are also a significant concern and could impact operations. Direct impacts to employees are possible, including injury, death, and an impeded ability of essential personnel to report for duty may also hinder operations.

No increase in impact from earthquakes can be caused by climate change. Earthquakes can cause displacement, changing population patterns throughout their service area. LHHCWD has no jurisdiction over land use, development and zoning, socially vulnerable populations, and/or land development within their service area, especially post-earthquake disasters. Water districts nationwide follow the standards set by the American Water Works Association and USEPA governing public water systems.

Figure 5. How Ground Displacement Can Severe Pipes



Liquefaction may cause buried domestic water pipes to sink, impacting gravity-fed systems. Once liquefied soils re-solidify after a quake, they will have to be dug up and repaired. Lateral spreading may damage wells and percolation ponds. LHHCWD could experience a loss of water from damaged systems.

State Water Project assets like water pipelines, ground shaking, displacement, and liquefaction may cause canals and laterals to crack, sever, and otherwise fail.

Climate change is expected to alter the typical precipitation patterns in Southern California. Both rainy and drought periods are predicted to become more intense and frequent. As a result, more precipitation is likely to occur during rainy seasons, while droughts are expected to persist for longer durations. Prolonged drought conditions may increase groundwater withdrawal, lowering groundwater levels. Consequently, climate change could increase or decrease the risk of liquefaction in the LHHCWD service area depending on these circumstances.

Building Facilities: Shaking, ground displacement, and liquefaction can cause structural failure in buildings, including the District's administrative and shop buildings. Less catastrophic events may cause unanchored furniture and items on shelves to fall. Failure may result in employee and customer deaths and injuries if an event occurs during work hours. Further, crews out in the field may also be injured or killed.

Energy Storage and Power Failure: An adequate energy supply is critical for LHHCWD to maintain its daily processes and functions. Power failures occur when the reliable, uninterrupted supply of energy to all or part of the service area is disrupted, affecting LHHCWD's ability to provide service. In summary, the entire District, including all current and future assets (infrastructure, buildings, critical facilities, and population), is considered at risk of earthquake events.

4.3.3 Landslides

Probability: (50-75%) Likely – The probability of future landslides in the LHHCWD service area is rated as **Likely (2)** based on a qualitative assessment using FEMA's hazard screening criteria. This ranking reflects the area's steep topography, erodible soils in the Puente Formation, and proximity to the seismically active Whittier Fault, which increases the likelihood of earthquake-induced landslides. The Mediterranean climate, with wet winters delivering 15-20 inches of rainfall annually, frequently saturates soils, particularly during El Niño years. Historical data indicates a 15-25% annual probability of minor landslides in susceptible areas, with a 5-8% chance of a major event every decade, according to USGS Landslide Hazard Program estimates. Human activities, such as hillside development and vegetation removal, further elevate the risk by destabilizing slopes.

Impact: Limited

Priority: Likely

* This section examines all the hazards affecting the district within its boundaries, which the Planning Team identified.

General Definition: A landslide is the downslope movement of rock, debris, or earth triggered by gravity, often initiated by heavy rainfall, earthquakes, or human activities such as grading or vegetation removal. Landslides range from slow-moving slumps to rapid debris flows, posing risks to water infrastructure, including pipelines, reservoirs, and pump stations, as well as to human life and property. For the La Habra Heights County Water District, landslides threaten the reliability of water and wastewater services due to the district's hilly terrain and geologically unstable soils.

Location: LHHCWD serves the City of La Habra Heights, located in the Puente Hills of Los Angeles County, approximately 20 miles southeast of downtown Los Angeles. The service area features rolling hills and steep slopes, with elevations ranging from 300 to 1,000 feet above sea level. Landslide-prone areas are primarily in the northern and eastern parts, particularly along Hacienda Road, East Road, and near Powder Canyon, where slopes exceed 15-25 degrees. The region's geology, dominated by the Puente Formation's sedimentary rocks (sandstone and shale), is prone to erosion and instability. Proximity to the Whittier Fault increases the risk of earthquake-triggered landslides.

Figure 6. Landslide Map with LHHCWD Boundaries

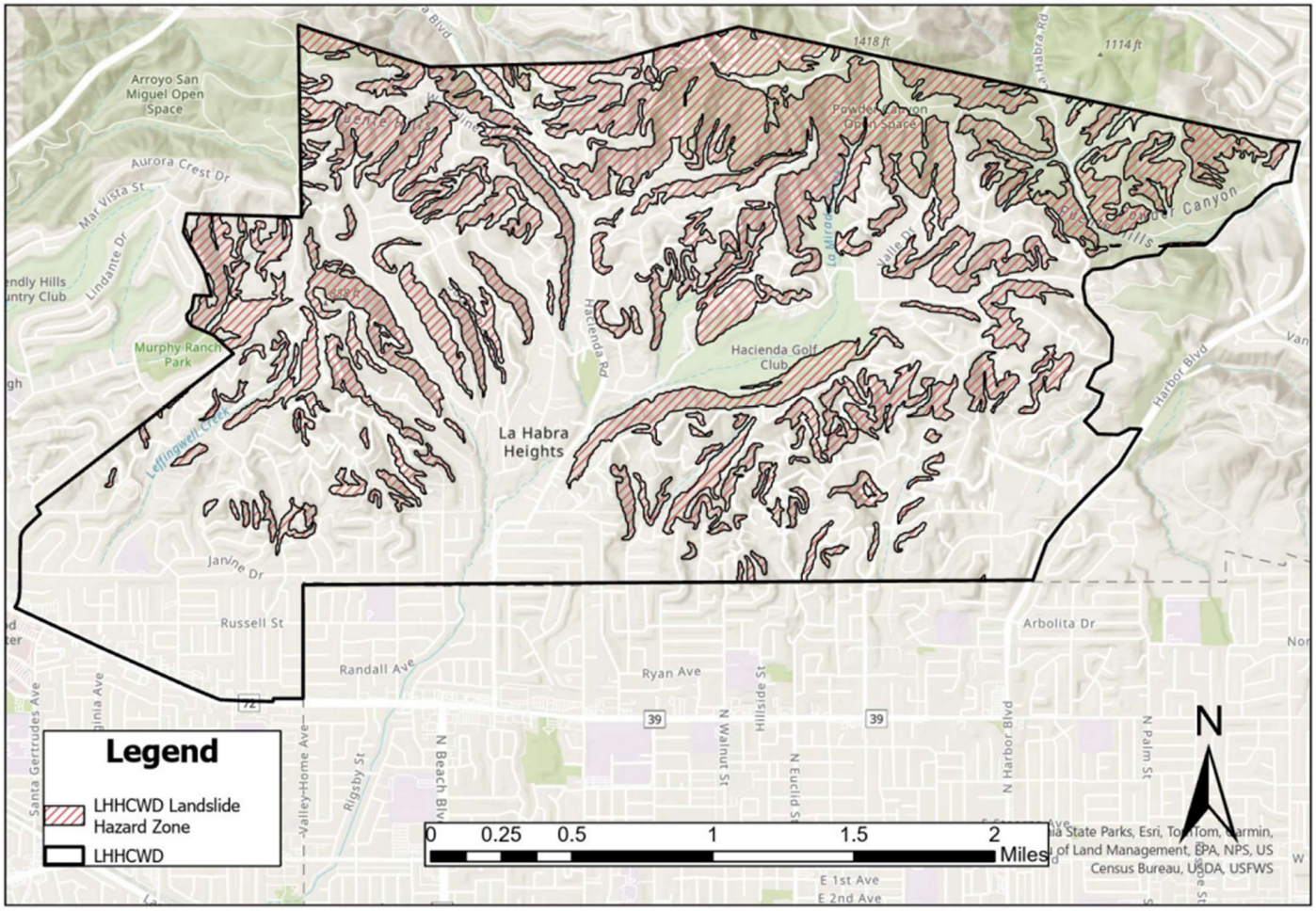


Table 10. 2020-2025 Significant Landslides in Los Angeles County

Name	Year	Details
Hacienda Heights Debris Flows	2023	Pounding rainfall triggered damaging debris and mudflows in hillside neighborhoods, including Hacienda Heights (near La Habra Heights), affecting homes and roads.
Palos Verdes Peninsula Landslide Expansion	2023	A decades-old landslide complex on the Palos Verdes Peninsula expanded due to heavy rainfall in

		2023, affecting hundreds of buildings and infrastructure.
Palos Verdes Peninsula Landslide Acceleration	2024	Continued movement of the Palos Verdes landslide complex, accelerated by heavy precipitation in early 2024, further damaging buildings and roads.
Mudslide on Hacienda Rd after sever rain event #3	February 2024	Severe mudslide within LHHCWD service district
Post-Palisades/Eaton Fire Debris Flows	2025	Following the 2025 Palisades (23,713 acres) and Eaton (14,117 acres) wildfires, rainfall on January 27, 2025, triggered debris flows along Palisades Drive, requiring crews to clear mud and debris

Extent: The extent of landslides is assessed using the United States Geological Survey (USGS) Landslide Susceptibility Map, which classifies parts of La Habra Heights as having **moderate to high landslide susceptibility** due to steep slopes and erodible soils. Landslides may range from localized slumps (100-1,000 square feet) to debris flows impacting multiple acres, especially in canyons or post-wildfire conditions. Earthquake-triggered landslides are linked to the Modified Mercalli Intensity (MMI) Scale, where intensities of VI or higher can initiate slope failures. Impacts include damage to water pipelines, restricted access to reservoirs, and sedimentation affecting water treatment facilities.

History

Historical landslide events in La Habra Heights and nearby Los Angeles County highlight the hazard's impact:

- **1995 Winter Storms**: Heavy rainfall caused mudflows along Hacienda Road, damaging water pipelines and requiring emergency repairs.
- **2005 Blue Jay Way Landslide**: Prolonged rainfall triggered a significant landslide, disrupting utilities and costing an estimated $250,000 in repairs to LHHCWD infrastructure.
- **2014 La Habra Earthquake (M5.1)**: Minor slope failures in the Puente Hills impacted access to pump stations, necessitating debris clearance.

- **2019 Post-Wildfire Debris Flows**: Following the 2018 Holy Fire in nearby Orange County, heavy rains caused debris flows in Powder Canyon, affecting access to LHHCWD facilities.

Los Angeles County records indicate 3-5 minor landslides annually during wet seasons, with major events occurring approximately every 5-7 years during extreme rainfall or seismic activity.

Climate Change Impacts

Climate change is likely to increase landslide risks in the LHHCWD service area through:

- **Intensified Precipitation**: The California Climate Assessment (2024) projects more extreme winter storms, increasing soil saturation and triggering debris flows in the Puente Hills.
- **Post-Wildfire Debris Flows**: More frequent wildfires, driven by higher temperatures and prolonged droughts, remove vegetation, heightening landslide risk during subsequent rains.
- **Population Exposure**: Approximately 20% of the population (1,000 out of 5,000 residents, per 2020 Census data) lives in areas with moderate to high landslide risk. Intensified events may increase vulnerability for seniors and socioeconomically disadvantaged groups.
- **Critical Facilities**: Facilities like the Reservoir 10A, located northeast of Hacienda Rd. and Plant 6 Pump Station, located near slopes, face increased risks from debris flows disrupting access or damaging infrastructure.

Vulnerability

The vulnerability of LHHCWD to landslides is assessed as follows:

- **Population**: About 20% of the service area population (1,000 residents) resides in hilly zones with moderate to high landslide risk, based on 2020 Census intersect analysis. Vulnerable groups, such as seniors and those with limited English proficiency, may face evacuation challenges or service disruptions.
- **Critical Facilities**: Facilities including the Reservoir 10A, Plant 6Pump Station, and multiple cross country water transmission mains are at risk due to their proximity to steep slopes or canyons. Landslides could restrict access or damage critical infrastructure.

- **Infrastructure**: Pipelines crossing drainages (e.g., Powder Canyon) are susceptible to being severed or buried by debris flows. Reservoirs on elevated sites may experience foundation instability.

Within the 2020-2025 timeframe, five federal and/or state declarations were declared for California's severe winter storms, straight-line winds, flooding, landslides, and mudslides within the LHHCWD service area. Notice is hereby given that, in a letter dated January 14, 2023 (DR-4683-CA), April 3, 2023 (DR-4699-CA), April 13,2024 (DR-4769-CA), (EM-3591-CA), and (EM-3592-CA) dated March 16, 2023, the President issued a major disaster declaration under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq. (the "Stafford Act"), as follows:

> *"I have determined that the damage in certain areas of the State of California resulting from severe winter storms, straight-line winds, flooding, landslides, and mudslides beginning on [December 27, 2022, January 8, 2023, February 21, 2023, and January 31, 2024] and continuing is of sufficient severity and magnitude to warrant a major disaster declaration under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq. (the "Stafford Act"). Therefore, I declare that such a major disaster exists in California…."*

Impact Statement

Landslides pose a significant threat to LHHCWD's ability to deliver reliable water and wastewater services. A major event could:

- Water pipelines, disrupting water supply to customers.
- Contaminate water sources with sediment, requiring costly treatment.
- Block access to critical facilities, delaying maintenance or emergency response.
- Require coordination with Los Angeles County Public Works and the City of La Habra Heights for debris removal and infrastructure repairs.

The following table is a replacement cost estimate for all LHHCWD-owned critical facilities.

Table 11. Landslides Replacement Costs

LHHCWD / Landslide Volume/Size Classification	Replacement Value
Very Large: >100,000 m³ (e.g., catastrophic landslides) 100%	
LHHCWD – All Critical Assets	$15,000,000
Large: 10,000–100,000 m³ (e.g., significant debris flows or slides) 80%	
LHHCWD – All Critical Assets	$12,00,000
Moderate: 1,000–10,000 m³ (e.g., small debris flows) 0%	
LHHCWD – All Critical Assets	$0
Small: <1,000 m³ (e.g., localized slumps) 0%	
LHHCWD – All Critical Assets	$0

Most landslides in La Habra Heights are expected to be small to moderate (100-10,000 m³), such as those triggered by winter storms or earthquakes (e.g., 2014 La Habra Earthquake). Large events (>10,000 m³) are less common but possible in post-wildfire scenarios, potentially burying pipelines or blocking access to pump stations.

Mitigation Considerations

To mitigate landslide risks, LHHCWD can:

- Install slope stabilization measures (e.g., retaining walls, gabions) near critical facilities.
- Enhance drainage systems to reduce soil saturation in high-risk areas.
- Conduct annual geotechnical assessments of infrastructure in landslide-prone zones.
- Develop post-wildfire debris flow response plans with Los Angeles County Fire Department and the City of La Habra Heights.
- Promote public outreach on landslide preparedness and vegetation management to stabilize slopes.

4.3.4 Windstorms

Probability: (25-50%) Somewhat Likely – Historical windstorm data for LHHCWD and its region indicate at least 118 significant windstorms within the last 0.4 years. This equates to a windstorm every month on average in any given year. Based on this data, LHHCWD determined that future windstorm occurrence within their boundaries continues to be likely.

Impact: Limited

Priority: Somewhat Likely

* This section examines all the hazards affecting the district within its boundaries, which the Planning Team identified.

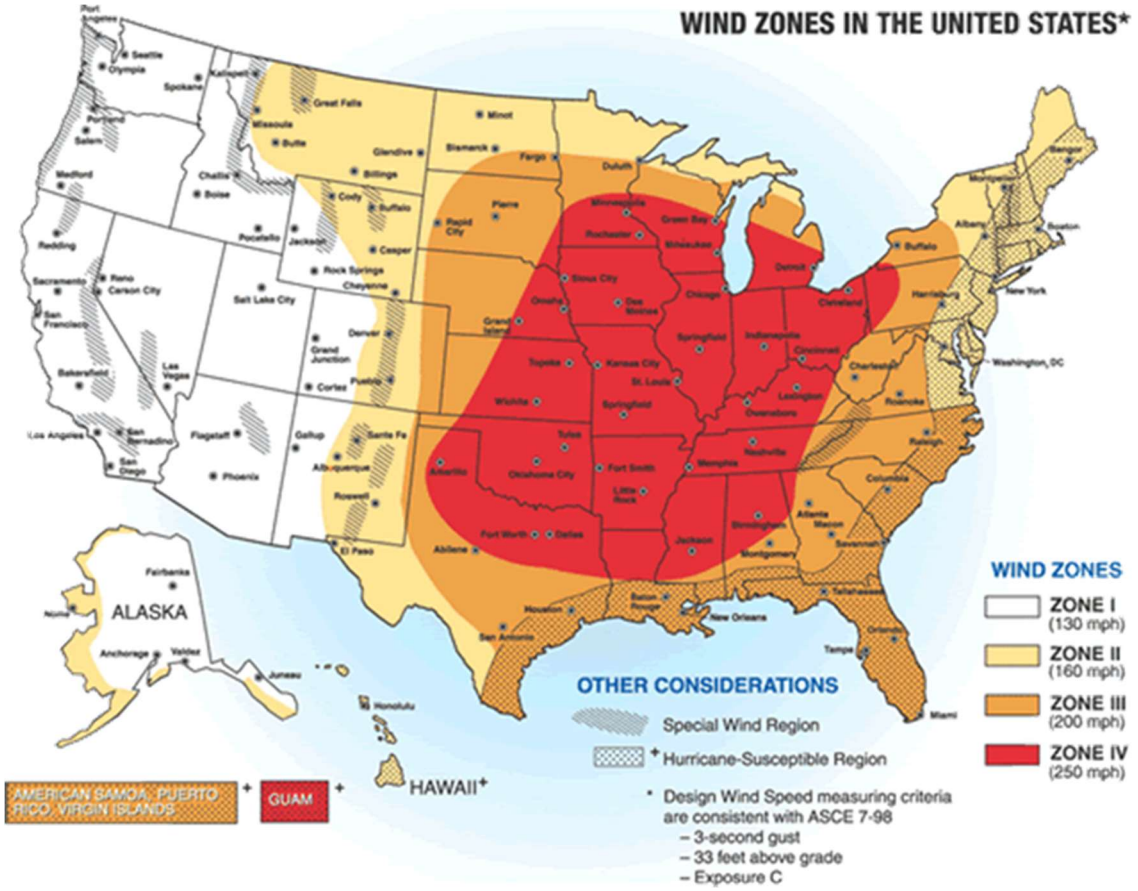
General Definition: Several types of wind hazards affect the planning area. These

include high or strong wind events, typically associated with Santa Ana winds, and thunderstorm wind events (including straight-line winds and microbursts). High Wind definitions can vary by region. In general, high wind events are those events greater than normal averages and have damage potential. Wind events are common throughout the United States. However, the severity varies depending on location. Santa Ana Winds occur throughout September through November of each year.

Probability: If winds increase due to climate change, the probability of affecting LHHCWD is low due to the implementation of mitigation actions, such as generators that can power the water distribution system.

As climate change progresses, more high-pressure zones develop in the plains in Arizona, Nevada, and Utah, and low-pressure zones develop in Southern Arizona and Mexico, causing the Santa Ana winds to develop more frequently. This will increase the chances of PSPS events and regional power outages.

Figure 7. Wind Zones in the United States



Climate Change Impacts

The following summarizes changes in exposure and vulnerability to the windstorm hazard resulting from climate change:

Population—Population exposure and vulnerability to windstorms are unlikely to increase because of climate change, and significant life or health impacts are unlikely.

Critical facilities – All critical facilities' exposure and vulnerability will likely increase due to climate change.

Vulnerability & Impact: Severe wind events can harm people throughout the LHHCWD service area but have a greater effect on the safety of people experiencing homelessness and those working outdoors. Severe wind events may impact populations that work outside or have respiratory illnesses as they can generate dust and other contaminants that can affect the health of residents and workers. Lower-income residents, who may not have the financial resources to purchase homes (or are renting homes) that are not built

or retrofitted to withstand powerful winds, could also have difficulty recovering from wind events.

Southern California and LHHCWD service area all suffer from seasonal Santa Ana Winds and will for the foreseeable future. Extreme wind events can worsen other risks, such as wildfires. It could affect the take-off and landing of small aircraft at nearby airports, leading to an increased risk of possible aircraft incidents. There are no direct planned development updates or land use changes occurring within the LHHCWD service area that would directly increase the vulnerability of the LHHCWD-identified assets to windstorms.

The following table is a replacement cost estimate for all LHHCWD-owned critical facilities.

Table 12. Windstorm Replacement Costs

LHHCWD / Wind Severity based on Beaufort scale	Replacement Value
Very High Wind Speeds (Scale 12-10) 25%	
LHHCWD – All Critical Assets	$3,750,000
High Wind Speeds (Scale 9-7) 8%	
LHHCWD – All Critical Assets	$1,200,000
Moderate Wind Speeds (Scale 6-4) 0%	
LHHCWD – All Critical Assets	$0
Low Wind Speeds (3-0) 0%	
LHHCWD – All Critical Assets	$0

Description: Santa Ana Winds are a regional wind hazard specific to Southern California. Santa Ana Winds are known to cause large amounts of damage and increase the spread of wild and structural fires. Santa Ana winds are generally defined as warm, dry winds blowing east. The complex topography of Southern California and various atmospheric conditions create numerous scenarios that may cause widespread or isolated Santa Ana events. Winds are caused by a low-pressure system over the southern coastline and high pressure over the Great Basin in Nevada. When the high pressure

turns counterclockwise, the warm, dry air is pulled to the low-pressure zone and out to the Pacific Ocean. Santa Ana Winds are quick and effective at spreading wildfires. The combination of windstorm activity with the major fires every few years creates the greatest danger to the urban/wildland interface. Santa Ana winds spread the flames at even greater speed than in times of calm wind conditions.

The National Weather Service Center normally issues a high wind advisory or warning depending on the following criteria. A wind advisory is issued when conditions are favorable for developing high winds overall or in part of the forecast area, but the occurrence is still uncertain. The criteria of a wind advisory are sustained winds of 31 to 39 mph and/or gusts of 46 to 57 mph for any duration. A high wind warning is issued when sustained winds of 40 or higher are expected for at least one hour or any wind gusts are expected to reach 58 mph or more. Forecasters at the National Weather Service 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 (approximately 29 miles per hour). Table 11 is a Beaufort wind scale that shows the appearance of wind effects based on the knots of wind and its classification.

Table 13. Beaufort Wind Scale

Beaufort grade	Kind of wind	Knots		km/h		Effects		Height of waves (metre)
		Min	Max	Min	Max	Earth	Sea	
0	Calm	<1		<1		Smoke rises vertical	Flat sea	-
1	Very light	1	3	1	5	The wind bends smoke	Small ripples with no white foamy crests.	0.1
2	Light breeze	4	6	6	11	It can be felt on face	Small wavelets, with unbroken crests.	0.2 - 0.3
3	Gentle breeze	7	10	12	19	It shakes leaves	Very small crests; crests begin to break.	0.6 - 1
4	Moderate breeze	11	16	20	28	It lifts dust and papers	Small waves that begin to grow longer; spuma più frequente e più evidente.	1 - 1.5
5	Fresh breeze	17	21	29	38	It shakes branches	Moderate waves that grow longer in shape; possible spray.	2 - 2.5
6	Strong breeze	22	27	39	49	It shakes big branches	Bigger waves; white foamy crests are longer everywhere.	3 - 4
7	Near gale	28	33	50	61	It impedes walking	The sea swells up; white foam forms when waves break up.	4 - 5.5
8	Gale	34	40	62	74	It shakes big trees	Medium-high, longer waves; crests start to break up in sprays.	5.5 - 7.5
9	Strong gale	41	47	75	88	Chimney pots and slated removed	High waves; tight strips of foam form in the direction of the wind.	7 - 10
10	Storm	48	55	89	102	It uproots trees	Very high waves with long crests; the sea looks completely white; waves fall down violently, visibility is reduced.	9 - 12.5
11	Violent storm	56	63	103	117	Serious devastation	Exceptionally high waves (small and medium tonnage ships disappear for a few seconds); visibility is still more reduced.	11.5 - 16
12	Hurricane	>64		>118		Very serious catastrophes	Air is filled with foam and sprays; sea is completely white because of foam; visibility is greatly reduced.	>14

Table 14. Windstorm History From NOAA 2020-2025 Los Angeles County

Location Within Los Angeles County	Begin Date	End Date
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	1/5/2020	1/5/2020
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	2/4/2020	2/4/2020
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	4/22/2020	4/23/2020
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	6/8/2020	6/8/2020

LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	10/26/2020	10/26/2020
LOS ANGELES COUNTY SAN FERNANDO VALLEY (ZONE)	10/26/2020	10/26/2020
SANTA MONICA MOUNTAINS RECREATION AREA (ZONE)	10/26/2020	10/26/2020
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	11/26/2020	11/26/2020
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	12/2/2020	12/3/2020
SANTA MONICA MOUNTAINS RECREATION AREA (ZONE)	12/3/2020	12/3/2020
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	12/7/2020	12/8/2020
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	1/19/2021	1/19/2021
SANTA CLARITA VALLEY (ZONE)	1/19/2021	1/19/2021
LOS ANGELES COUNTY SAN FERNANDO VALLEY (ZONE)	1/19/2021	1/19/2021
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	2/13/2021	2/14/2021
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	2/16/2021	2/16/2021
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	2/25/2021	2/25/2021
SANTA MONICA MOUNTAINS RECREATION AREA (ZONE)	2/25/2021	2/25/2021
LOS ANGELES COUNTY SAN FERNANDO VALLEY (ZONE)	2/25/2021	2/25/2021
LOS ANGELES COUNTY MOUNTAINS EXCLUDING	2/28/2021	2/28/2021

THE SANTA MONICA RANGE (ZONE)		
LOS ANGELES COUNTY SAN FERNANDO VALLEY (ZONE)	2/28/2021	2/28/2021
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	10/11/2021	10/11/2021
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	11/21/2021	11/21/2021
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	11/24/2021	11/25/2021
LOS ANGELES COUNTY SAN FERNANDO VALLEY (ZONE)	11/24/2021	11/25/2021
SANTA MONICA MOUNTAINS RECREATION AREA (ZONE)	11/24/2021	11/25/2021
LOS ANGELES COUNTY COASTS INCLUDING DOWNTOWN LOS ANGELES (ZONE)	11/25/2021	11/25/2021
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	1/14/2022	1/14/2022
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	1/21/2022	1/22/2022
SANTA CLARITA VALLEY (ZONE)	1/21/2022	1/21/2022
SANTA MONICA MOUNTAINS RECREATION AREA (ZONE)	1/21/2022	1/22/2022
LOS ANGELES COUNTY SAN GABRIEL VALLEY (ZONE)	1/21/2022	1/22/2022
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	1/28/2022	1/28/2022
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	2/10/2022	2/10/2022
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	2/17/2022	2/17/2022

LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	3/10/2022	3/11/2022
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	3/13/2022	3/13/2022
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	3/16/2022	3/16/2022
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	3/20/2022	3/20/2022
LOS ANGELES COUNTY MOUNTAINS EXCLUDING THE SANTA MONICA RANGE (ZONE)	3/27/2022	3/28/2022
LOS ANGELES COUNTY MOUNTAINS (ZONE)	6/13/2022	6/14/2022
ANTELOPE VALLEY (ZONE)	11/8/2022	11/8/2022
LOS ANGELES COUNTY MOUNTAINS (ZONE)	11/15/2022	11/16/2022
LOS ANGELES COUNTY SAN FERNANDO VALLEY (ZONE)	11/15/2022	11/16/2022
SANTA MONICA MOUNTAINS (ZONE)	11/16/2022	11/16/2022
LOS ANGELES COUNTY MOUNTAINS (ZONE)	11/19/2022	11/19/2022
LOS ANGELES COUNTY MOUNTAINS (ZONE)	11/24/2022	11/24/2022
SANTA MONICA MOUNTAINS (ZONE)	11/24/2022	11/24/2022
LOS ANGELES COUNTY SAN FERNANDO VALLEY (ZONE)	11/24/2022	11/24/2022
LOS ANGELES COUNTY MOUNTAINS (ZONE)	12/10/2022	12/11/2022
ANTELOPE VALLEY (ZONE)	12/10/2022	12/11/2022
LOS ANGELES COUNTY MOUNTAINS (ZONE)	1/9/2023	1/10/2023
LOS ANGELES COUNTY MOUNTAINS (ZONE)	1/22/2023	1/23/2023
SANTA MONICA MOUNTAINS (ZONE)	1/26/2023	1/26/2023
LOS ANGELES COUNTY MOUNTAINS (ZONE)	1/26/2023	1/26/2023
LOS ANGELES COUNTY MOUNTAINS (ZONE)	1/30/2023	1/31/2023

CATALINA AND SANTA BARBARA ISLANDS (ZONE)	2/21/2023	2/22/2023
SANTA MONICA MOUNTAINS (ZONE)	2/24/2023	2/24/2023
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	3/14/2023	3/14/2023
NORTHWESTERN LOS ANGELES COUNTY MOUNTAINS INCLUDING THE INTERSTATE 5 CORRIDOR (ZONE)	3/14/2023	3/14/2023
WESTERN SAN FERNANDO VALLEY (ZONE)	4/3/2023	4/3/2023
SANTA CLARITA VALLEY (ZONE)	4/3/2023	4/3/2023
SANTA SUSANA MOUNTAINS (ZONE)	10/29/2023	10/30/2023
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	10/29/2023	10/30/2023
WESTERN SANTA MONICA MOUNTAINS (ZONE)	10/29/2023	10/29/2023
NORTHWESTERN LOS ANGELES COUNTY MOUNTAINS INCLUDING THE INTERSTATE 5 CORRIDOR (ZONE)	11/7/2023	11/8/2023
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	11/8/2023	11/9/2023
NORTHWESTERN LOS ANGELES COUNTY MOUNTAINS INCLUDING THE INTERSTATE 5 CORRIDOR (ZONE)	11/19/2023	11/19/2023
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	11/19/2023	11/21/2023
WESTERN ANTELOPE VALLEY FOOTHILLS (ZONE)	11/19/2023	11/19/2023
SANTA SUSANA MOUNTAINS (ZONE)	11/19/2023	11/21/2023
SANTA CLARITA VALLEY (ZONE)	11/19/2023	11/20/2023
WESTERN SANTA MONICA MOUNTAINS (ZONE)	11/20/2023	11/21/2023

SANTA SUSANA MOUNTAINS (ZONE)	12/8/2023	12/10/2023
CATALINA AND SANTA BARBARA ISLANDS (ZONE)	1/7/2024	1/7/2024
CATALINA AND SANTA BARBARA ISLANDS (ZONE)	1/10/2024	1/11/2024
NORTHWESTERN LOS ANGELES COUNTY MOUNTAINS INCLUDING THE INTERSTATE 5 CORRIDOR (ZONE)	1/11/2024	1/11/2024
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	1/11/2024	1/11/2024
EST SAN GABRIEL MOUNTAINS (ZONE)	1/11/2024	1/11/2024
SANTA SUSANA MOUNTAINS (ZONE)	1/11/2024	1/11/2024
EST SAN GABRIEL MOUNTAINS (ZONE)	3/2/2024	3/2/2024
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	3/2/2024	3/2/2024
EST SAN GABRIEL MOUNTAINS (ZONE)	3/14/2024	3/14/2024
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	3/14/2024	3/14/2024
SANTA SUSANA MOUNTAINS (ZONE)	3/14/2024	3/14/2024
LOS ANGELES COUNTY SAN GABRIEL VALLEY (ZONE)	3/14/2024	3/14/2024
NORTHWESTERN LOS ANGELES COUNTY MOUNTAINS INCLUDING THE INTERSTATE 5 CORRIDOR (ZONE)	6/17/2024	6/17/2024
EST SAN GABRIEL MOUNTAINS (ZONE)	1/7/2025	1/8/2025
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	1/7/2025	1/10/2025
SANTA SUSANA MOUNTAINS (ZONE)	1/7/2025	1/10/2025
WESTERN SAN FERNANDO VALLEY (ZONE)	1/7/2025	1/8/2025
LOS ANGELES COUNTY SAN GABRIEL VALLEY (ZONE)	1/7/2025	1/8/2025

WESTERN SANTA MONICA MOUNTAINS (ZONE)	1/7/2025	1/7/2025
MALIBU COAST (ZONE)	1/7/2025	1/8/2025
EST SANTA MONICA MOUNTAINS (ZONE)	1/7/2025	1/7/2025
SANTA CLARITA VALLEY (ZONE)	1/7/2025	1/8/2025
NORTHWESTERN LOS ANGELES COUNTY MOUNTAINS INCLUDING THE INTERSTATE 5 CORRIDOR (ZONE)	1/7/2025	1/8/2025
EST SAN FERNANDO VALLEY (ZONE)	1/7/2025	1/8/2025
SANTA SUSANA MOUNTAINS (ZONE)	1/11/2025	1/15/2025
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	1/11/2025	1/15/2025
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	1/20/2025	1/21/2025
SANTA SUSANA MOUNTAINS (ZONE)	1/20/2025	1/20/2025
NORTHWESTERN LOS ANGELES COUNTY MOUNTAINS INCLUDING THE INTERSTATE 5 CORRIDOR (ZONE)	1/20/2025	1/20/2025
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	1/22/2025	1/23/2025
SANTA SUSANA MOUNTAINS (ZONE)	1/22/2025	1/23/2025
WESTERN SAN GABRIEL MOUNTAINS INCLUDING THE HIGHWAY 14 CORRIDOR (ZONE)	2/13/2025	2/13/2025
NORTHWESTERN LOS ANGELES COUNTY MOUNTAINS INCLUDING THE INTERSTATE 5 CORRIDOR (ZONE)	2/13/2025	2/13/2025

Within the 2020-2025 timeframe, five federal and/or state declarations were declared for California's severe winter storms, straight-line winds, flooding, landslides, and mudslides within the LHHCWD service area. Notice is hereby given that, in a letter dated January 14, 2023 (DR-4683-CA), April 3, 2023 (DR-4699-CA), April 13,2024 (DR-4769-CA), (EM-

3591-CA), and (EM-3592-CA) dated March 16, 2023, the President issued a major disaster declaration under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq. (the "Stafford Act"), as follows:

> *"I have determined that the damage in certain areas of the State of California resulting from severe winter storms, straight-line winds, flooding, landslides, and mudslides beginning on [December 27, 2022, January 8, 2023, February 21, 2023, and January 31, 2024] and continuing is of sufficient severity and magnitude to warrant a major disaster declaration under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq. (the "Stafford Act"). Therefore, I declare that such a major disaster exists in California…."*

Impact Statement: All the service areas within LHHCWD have windstorm events; the entire planning area is equally at risk of this hazard. Severe wind has the potential to damage reservoirs, treatment plant facilities, and wells. Structures can also be damaged, including blown-off shingles, siding, awnings, and other features of buildings and overturning of trees. Objects picked up by the wind, including palm fronds and litter, can be hurled through the air, damaging assets and structures when contact is made. In some cases, structures may be blown off foundations, or infrastructure, such as reservoirs, may be blown off their base. In addition, mobile or modular units (such as those installed for temporary uses) are considered at a higher risk of severe wind. Severe winds can cause damage to communications infrastructure, utility poles, and above-ground power lines, resulting in loss of power. Falling trees also contribute to power line disruptions. When strong winds reach a force great enough to threaten above-ground facilities, power pole lines and power outages may be experienced. These events are known as Public Safety Power Shutoffs (PSPS). PSPS are temporary and are meant to keep the community safe. PSPS events only happen during periods of high winds. There have not been any PSPS events in the last 5 years that have had a negative effect or loss of water in the LHHCWD service area.

The entire service area, including all current and future assets (infrastructure, buildings, critical facilities, and population), is vulnerable to severe annual winds due to the topography and movement of weather fronts through the area. Exposed (e.g., above-ground) assets are considered most at risk of severe winds.

4.3.5 Climate Change – Induced Drought

Probability: (25-50%) Historical drought data for LHHCWD and the La Habra Heights region indicate at least 5 multi-year significant droughts within the last 50 years, based on California drought records. This equates to an average drought every 10 years or a 10 percent chance of a drought in any given year. Based on this data, combined with the area's Mediterranean climate, reliance on imported water from the Metropolitan Water District of Southern California, and the potential for prolonged dry periods and reduced precipitation due to climate change, LHHCWD determined that future drought occurrence within their boundaries is highly likely. This section evaluates all hazards affecting the District within its boundaries, as identified by the Planning Team.

Impact: *Limited*

Priority: *Somewhat likely*

General Definition: A drought is a period of below-average precipitation in a given region resulting in prolonged shortages in its water supply, surface water, or groundwater. Climatic factors such as high temperatures, high wind, and low relative humidity are often associated with drought. Drought occurs in virtually all climatic zones, varying significantly from one region to another. Droughts occur when there are extended periods of inadequate rainfall. The cycle of droughts and wet periods is often part of El Niño and La Niña weather cycles.

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. It is generally difficult to pinpoint a drought's beginning and end. In California, a few dry months do not typically constitute a drought. Because the impacts of a drought accumulate slowly at first, a drought may not be recognized until it has become well established. Even during a drought, there may be one or two months with above-average precipitation totals. These wet months do not necessarily signal the end of a drought and generally do not majorly impact moisture deficits. Droughts can persist for several years before regional climate conditions return to normal. While drought conditions can occur at any time throughout the year, the most apparent time is during the summer months.

Climate Change Probability: The probability of damage to LHHCWD caused by climate change will increase. Drought's probability will increase in the southwestern United States, creating longer and hotter days with less rain, leading to long periods of drought. Research supports that climate change will significantly impact drought frequency and intensity, varying by region. Higher temperatures increase evaporation rates, including more moisture loss through plant leaves. Even in regions where precipitation does not decrease, increases in surface evaporation will lead to more rapid drying of soil if not

offset by other changing factors, such as reduced wind speed or humidity. As soil dries out, more of the sun's incoming heat will go toward heating soil and adjacent air rather than evaporating moisture, resulting in hotter temperatures and drier conditions.

Measuring Droughts: There are several quantitative methods for measuring drought in the United States. The U.S. Drought Monitor is a relatively new index that combines quantitative measures with input from experts in the field.

In March 2022, California's Governor Newsom implemented an executive order (Executive Order N-7-22) to address the impacts of the drought in California. This order required urban water suppliers, such as LHHCWD, to adopt more stringent water conservation efforts, including but not limited to banning irrigating "non-functional turf" and voluntarily activating a water shortage contingency planning Level 2.

Along with this executive order, and in accordance with the State Water Resources Control Board (SWRCB) and California Water Code (CWC) requirements as outlined in Sections 10632 and 10644, urban water supplies in California would have to prepare Annual Water Supply and Demand Assessments (AWSDA) and submit these assessments annually to the state to remain in compliance with water conservation efforts. LHHCWD promotes its water conservation efforts to its customers by actively making public notifications on its website and sending reminders. The current water schedule for all LHHCWD customers is posted online, as well as its permanent water conservation requirements to continue its efforts to conserve water to prepare for California's drought conditions.

Climate Change Impacts:

The following summarizes changes in exposure and vulnerability to the drought hazard resulting from climate change:

Population – Population exposure and vulnerability to drought are unlikely to increase due to climate change.

Critical facilities—Climate change is likely to increase the exposure and vulnerability of all critical facilities.

Vulnerability &Impacts: Underserved and vulnerable populations they serve include socioeconomically disadvantaged people; people with limited English proficiency; geographically isolated or educationally disenfranchised people; people of color as well as those of ethnic and national origin minorities; women and children; individuals with disabilities and others with access and functional needs; and seniors. Those who may live under bridges, in tents, or in makeshift housing along waterways. The socially vulnerable populations are most susceptible based on many factors, including how the

people respond to financial ability to purchase supplies. Food, clothing, and safe housing may be manageable for only short periods of time and then fall into extreme poverty, with a lack of resources and the ability to navigate special needs in an emergency or to manage to obtain adequate food, housing, food, clothing, or medical treatment.

In drought conditions, vulnerable populations may not be able to find adequate, safe, potable water supplies for drinking, cooking, or hygiene needs.

The following table is a replacement cost estimate for all LHHCWD-owned critical facilities.

Table 15. Drought Severity Replacement Costs

LHHCWD / Drought D0-D4 Severity	Replacement Value
D4 (Exceptional Drought)	
LHHCWD - All Critical Assets	$15,000,000
D3 (Extreme Drought)	
LHHCWD - All Critical Assets	$3,000,000
D2 (Severe Drought)	
LHHCWD - All Critical Assets	$0
D1 (Moderate Drought)	
LHHCWD - All Critical Assets	$0
D0 (Abnormally Dry)	
LHHCWD - All Critical Assets	$0

U.S. Drought Monitor: The U.S. Drought Monitor is designed to provide the general public, media, government officials, and others with an easily understandable overview of weekly drought conditions across a county throughout the United States. The U.S. Drought Monitor is unique because it assesses multiple numeric measures of drought, including the PDSI and three other indices, as well as experts' interpretations, to create a weekly map depicting drought conditions across the United States. The U.S. Drought Monitor uses five drought intensity categories, D0 through D4, to identify areas of drought.

The maps below are taken from https://droughtmonitor.unl.edu/Maps/MapArchive.aspx and show the drought differences between January 2019 and January 2024. Note the drastic difference between the two drought maps.

Figure 8. Drought Monitor January 2019

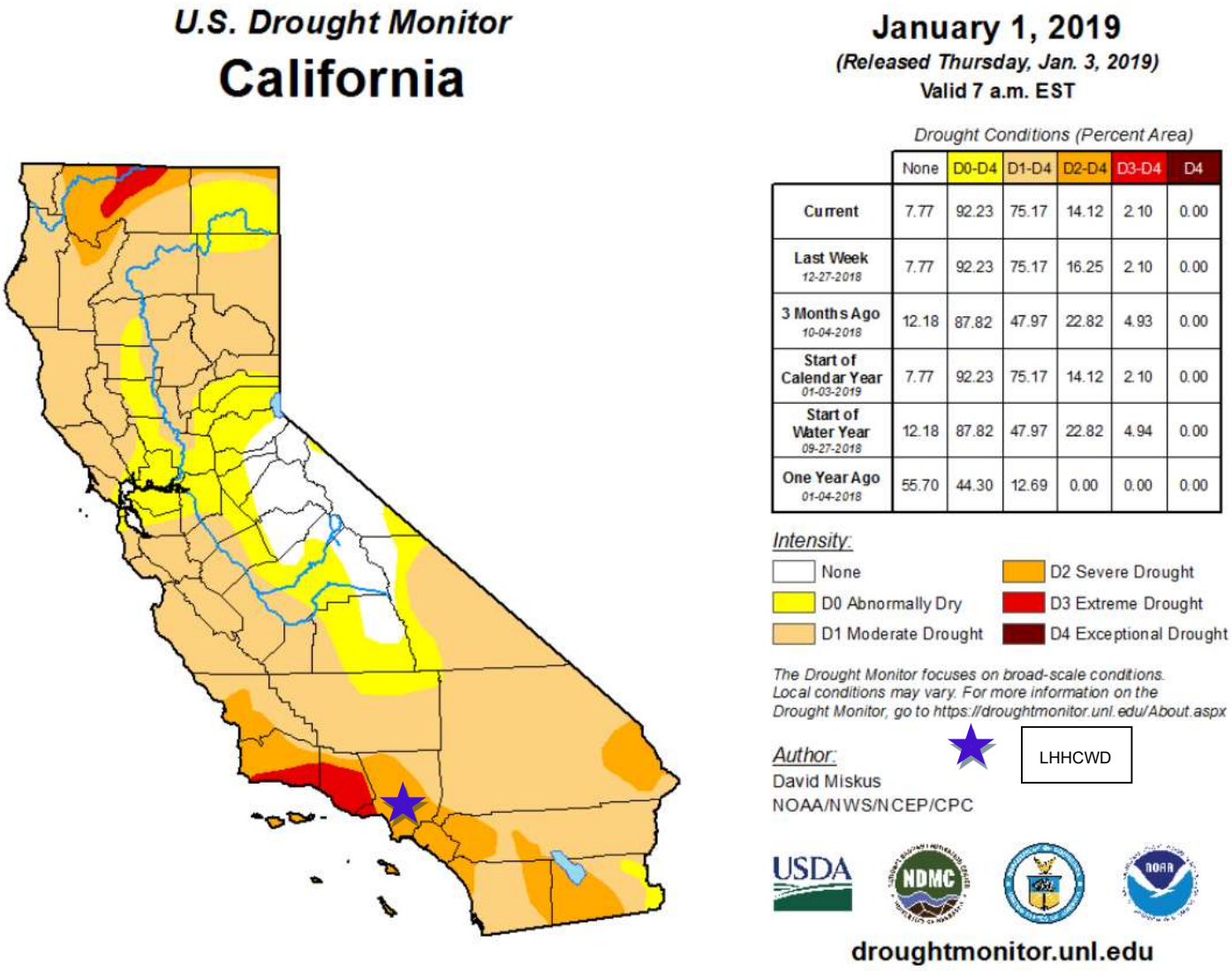


Figure 9. Drought Monitor January 2024

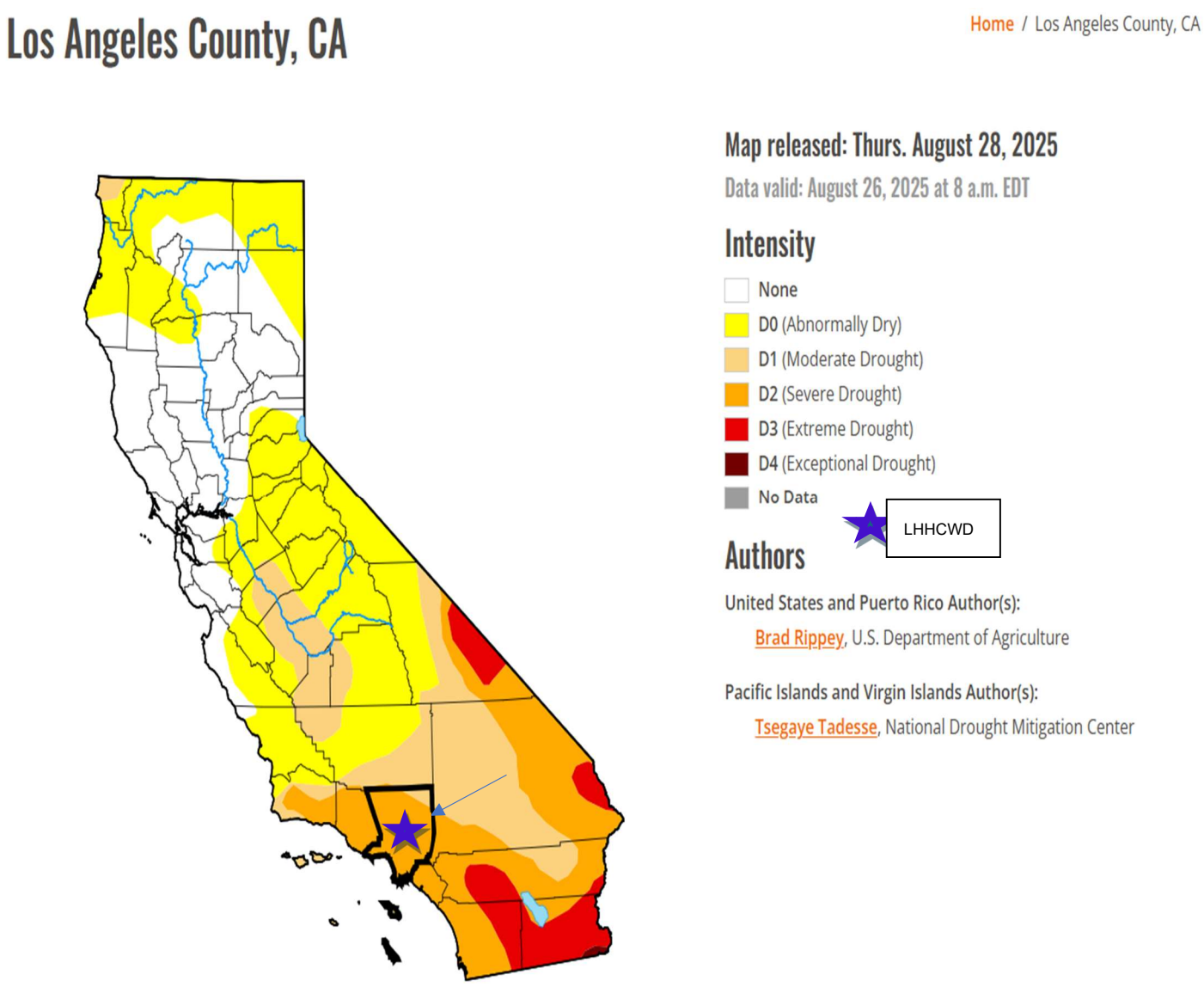


Table 16. U.S. Drought Monitor

D0	**Abnormally Dry**	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	**Moderate Drought**	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	**Severe Drought**	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	**Extreme Drought**	Major crop/pasture losses; widespread water shortages or restrictions
D4	**Exceptional Drought**	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

A drought is a regional event not confined to geographic or political boundaries; it can affect several areas simultaneously. It can also range in severity across those areas. Drought is now one of the main concerns in California, as the State has been in a drought period for the last eight years. Northern California experienced some relief in the winter of 2016; however, the El Niño effect expected to relieve the statewide drought did not materialize in Southern California. The lack of rain and, most importantly, the lack of snowfall in the Sierra Nevada Mountain range severely impacted most residents of California. LHHCWD's service area is at risk of drought occurrence and impacts.

Description: Climate change can be expected to increase drought frequency and severity in the service area. Warmer temperatures cause drought conditions by reducing soil moisture. Increased evapotranspiration and reduced snowpack projected with warmer temperatures will result in reduced flows.

Figure 10. Drought History (2000-2023)

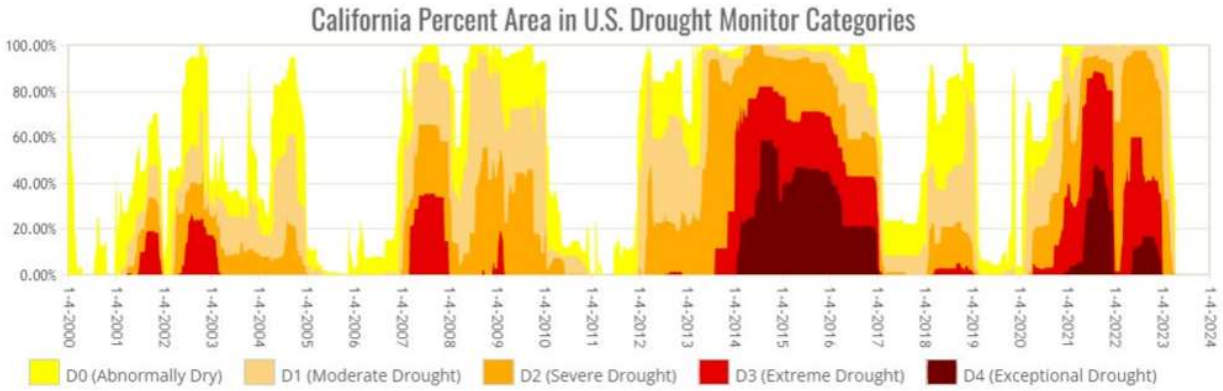


Table 17 Drought History in Southern California

Year	Drought History
1841	The drought was so bad that "a dry Sonoma was declared entirely unsuitable for agriculture."
1864	This drought was preceded by the torrential floods of 1861-1862, showing the fluctuation in climate back in the 1800s.
1924	This drought encouraged farmers to start using irrigation more regularly because of the fluctuation in California weather; the need for consistent water availability was crucial for farmers.
1929–1934	This drought was during the infamous Dust Bowl period that ripped across the plains of the United States in the 1920s and 1930s. The Central Valley Project was started in the 1930s in response to drought.
1950s	The 1950s drought contributed to the creation of the State Water Project.
1976–1977	1977 had been the driest year in state history to date. According to the *Los Angeles Times*, "Drought in the 1970s spurred efforts at urban conservation, and the state's Drought Emergency Water Bank came out of drought in the 1980s."
1986–1992	California endured one of the longest droughts ever observed from late 1986 through early 1992. Drought worsened in 1988 as much of the United States also suffered from severe drought. In California, the six-year drought ended in

	late 1992 as a significant El Niño event in the Pacific Ocean (and the eruption of Mount Pinatubo in June 1991) most likely caused unusually persistent heavy rains.
2007–2009	2007–2009 saw three years of drought conditions, the 12th worst drought period in the state's history, and the first drought for which a statewide proclamation of emergency was issued. The drought of 2007–2009 also saw greatly reduced water diversions from the State Water Project. The summer of 2007 saw some of the worst wildfires in Southern California history.
2011-2017	From December 2011 to March 2017, the state of California experienced one of the worst droughts to occur in the region on record. The period between late 2011 and 2014 was the driest in California history since record-keeping began.
2020 - 2022	January and February 2020 were dry to record dry in several areas (central CA and Northern CA-NV). The past three combined water years were California's driest on record.

Between late 2011 and 2021, the driest in California history since record-keeping began. In May 2015, a state resident poll conducted by Field Poll found that two out of three respondents agreed that water agencies should be mandated to reduce water consumption by 25%.

The 2015 prediction of El Niño to bring rain to California raised hopes of ending the drought. In the spring of 2015, the National Oceanic and Atmospheric Administration (NOAA) named the probability of the presence of El Niño conditions until the end of 2015 at 80%. Historically, sixteen winters between 1951 and 2015 had created El Niño. Six had below-average rainfall, five had average rainfall, and five had above-average rainfall. However, as of May 2015, drought conditions had worsened, and above-average ocean temperatures had not resulted in large storms. The drought led to Governor Jerry Brown's instituting mandatory 25% water restrictions in June 2015.

Approximately 102 million trees in California died from the 2011 – 2016 drought, of which 62 million died in 2016 alone. By the end of 2016, 30% of California had emerged from the drought, mainly in the northern half of the state, while 40% remained in the extreme or exceptional drought levels. Heavy rains in January 2017 were expected to significantly benefit the State's northern water reserves despite widespread power outages and erosional damage in the wake of the deluge.

Winter 2022-23 was the wettest in California, surpassing the previous record set in 1982–83. Governor Newsom declared an official end to the drought in April 2023. All 58 counties are listed in the Governor's severe drought impact. The winter of 2022 has had more rainfall and snow in California than the last 20 years alone.

Within the 2019 - 2024 timeframe, no federal and/or state declarations were declared for California Climate Change-induced drought within the LHHCWD service area.

Impact Statement: Water is also needed to manage structural and wildfires. A lack of, or limited, water supply presents wildfire management vulnerability. Substantial water is needed to fight wildfires, which are more frequent in dry conditions. While water for firefighting is a priority and no restrictions are in place, a lack of availability could slow this capability.

The entire planning area is equally at risk of this hazard. Most drought impacts, however, are not structural but societal in nature. A drought's impact on society, and thus the LHHCWD's service area, results from the interplay between a natural event and people's demand for water supply. LHHCWD is in charge of supplying potable water within its service area; therefore, it would be greatly impacted, both fiscally and politically, if it could not provide a reliable water supply due to drought conditions. Economically, water restrictions imposed during drought periods could result in lost revenue for LHHCWD. LHHCWD has no jurisdiction over land use, development and zoning, socially vulnerable populations, and/or land development within their service area. Water districts nationwide follow the standards set by the American Water Works Association and USEPA governing public water systems.

SECTION 5. COMMUNITY CAPABILITY ASSESSMENT

5.1 Introductions

The purpose of conducting the capability assessment is to determine LHHCWD's ability to implement a comprehensive mitigation strategy and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs, or projects.

The capability assessment has two components:

1. An inventory of the existing relevant plans, ordinances, or programs already in place and
2. An analysis of LHHCWD's capacity to bring them to fruition. A capability assessment highlights the positive mitigation activities within LHHCWD and will detect the potential gaps.

5.2 Emergency Management

To help mitigate the potential impacts of disasters, LHHCWD joined CalWARN. The District has a mutual aid agreement with CalWARN that covers most water and wastewater agencies in California. As a government entity (a Special District within California Law), the District can access the Emergency Managers Mutual Aid (EMMA) and the Emergency Management Assistance Compact (EMAC) for national mutual aid. In addition, the National WARN System can be accessed through the American Water Works Association.

CalWARN holds workshops twice a year for water agency members. It has also been planning public outreach, so the public has a better understanding of hazard mitigation planning in their communities. These workshops promote mitigation and how to prevent hazards' impacts on the utility's infrastructure. CalWARN has access to utility leaders, their past experiences during emergencies, and lessons learned on what they should have done differently. Sharing ideas and experiences is key to understanding mitigation in the future. LHHCWD currently employs 10 full-time employees, and by joining CalWARN, LHHCWD has the potential to have hundreds of mutual aid water/wastewater workers at its disposal within hours of an emergency. The pressure zones, reservoirs, wells, and maintenance work done at La Habra Heights County Water District are all operated by certified operators and maintained by various certified technical disciplines. In addition, the LHHCWD agrees with other water Agencies through CalWARN to support each other during an emergency by offering labor and equipment to the incident.

The General Manager has over 21 years of experience in the water industry. He has been with LHHCWD for 20 years. Throughout his career with the District, he has been mitigating earthquake, flood, and drought impacts that face the utility.

Emergency Response Plan (ERP): An emergency response plan outlines responsibility and how resources are deployed during and following an emergency or disaster. The primary objective of the plan is to guide the identification of potential emergencies, a timely and effective response, and the protection of the community's health and safety.

The ERP guides the process when an emergency occurs, including blueprinting general operations during a disaster, distributing and managing responsibilities among authorities, and identifying liability.

LHHCWD Emergency Response Plan was last revised in August 2021 and details how the district will respond to various emergencies and disasters. LHHCWD must be prepared to respond to a variety of threats that require emergency actions, including:

- Operational incidents, such as power failure or bacteriological contamination of water.
- Outside or inside malevolent acts, such as threatened or intentional contamination of water, intentional damage/destruction of facilities, detection of an intruder or intruder alarm, bomb threat, cyber security, or suspicious mail.
- Natural disasters like earthquakes or floods result in downed power failures.
- Communications with critical users, media outreach, and public notification process.

LHHCWD is also required to follow the Standard Emergency Management System (SEMS), the National Incident Management System (NIMS), and the Incident Command System (ICS) when responding to emergencies. Emergency Operations Center (EOC): An EOC provides a location, on or off-site, from which an agency coordinates a disaster response operation. In times of non-disasters, EOCs typically provide a centralized hub for communication and security oversight. LHHCWD’s administrative building and operations yard have the potential for two EOCs, one being the primary event center and the secondary being the corporate yard.

Emergency Management Training and Staff: Dedicated emergency management staff and regular training help prepare an agency for events and guide effective response and recovery.

LHHCWD conducts regular emergency exercises, following their emergency training plan. Through this training, the staff is trained across divisions within each District to assist with emergency response operations. Additionally, LHHCWD has a well-developed emergency notification process for critical staff.

5.3 Planning and Regulatory Capability

Planning and regulatory capability is based on implementing plans, policies, and programs that demonstrate LHHCWD's commitment to guiding and managing growth while maintaining the general welfare of the community. It includes emergency response and mitigation planning, master planning, capital planning, and enforcement of design and construction standards within the service area. Although conflicts can arise, these planning initiatives present significant opportunities to integrate hazard mitigation principles into LHHCWD's decision making process, in regards to the LHHCWD system. LHHCWD is not part of the city.

The Urban Water Management and Planning Act requires water suppliers to estimate water demands and available water supplies. LHHCWD is not required to have an Urban Water Master Plan as LHHCWD is under 3,300 service connections. LHHCWD's has an updated Water Master Plan that was completed in 2022.

These plans must also include impacts of climate change and water shortage contingency planning for dealing with shortages, including a catastrophic supply interruption.

Water Shortage Contingency Plan (WSCP)

Certain elements of the WSCP are required by the California Water Code (Water Code), including five specific response actions that align with six standard water shortage levels based on LHHCWD's water supply conditions and shortages resulting from catastrophic supply interruptions; LHHCWD WSCP was last updated July 11, 2023.The WSCP is implemented through a series of ordinances requiring water use restrictions in different stages

5.4 Existing Plans

The following emergency-related plans apply as appropriate:

- CalWARN Emergency Operations Plan – Updated every 10 years
- The District's Illness Injury Prevention Plan (IIPP) – Updated annually
- The District's Water Master Plan – Updated every 5 years
- Water Shortage Contingency Plan (WSCP)– Updated every 5 years
- Los Angeles County Fire Master Plan- Updated annually
- La Habra Heights Emergency Action Plan – Updated every 5 years
- Los Angeles County Flood Master Plan – Updated annually
- Los Angeles County Hazard Mitigation Plan – Updated every 5 years
- USEPA PSPS SOP for Public Water Systems – Updated every 5 years

5.5 Mitigation Programs

LHHCWD employees have experience with past hazard mitigation and hazard planning and can further enhance their hazard mitigation skills by participating in training offered by other agencies or regional governments.

To promote voluntary conservation, the District has initiated a public awareness and education plan consisting of the following:

- The District stores disaster supplies at its corporate yard and District office for employees during an emergency. The supplies are complete with cots, chairs, food bars, MREs, first aid kits, light sticks, batteries, blankets, personal sanitation kits, water, flashlights, etc.
- The District develops and maintains safety manuals and emergency response manuals that are specific to the facility where each employee works.

5.6 Fiscal Resources

The ability of LHHCWD to act is closely associated with the number of fiscal resources available to implement mitigation policies and projects. This may take the form of outside grant funding awards or District-based revenue and financing. The cost of mitigation policy and project implementation vary widely. In some cases, mitigation actions are tied primarily to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses are linked to an actual project, such as installing backup power generators and sustainable energy resources, which can require a substantial commitment from LHHCWD and state and federal funding sources. LHHCWD has made fiscal commitments to mitigate hazards through its Capital Improvement Plan (CIP).

The following is a summary of the District's fiscal capabilities. A number of governmental funds and revenue-raising activities can be allocated for hazard mitigation activities. Included below are potential sources of discretionary general funding from local, state, and federal resources.

- New connection fees
- State and Federal grants

Through the California Department of Water Resources, local grants and/or loans are available for water conservation, groundwater management, studies, and activities to enhance local water supply quality and reliability. Project eligibility depends on the type of organization(s) applying and participating in the project, as well as the specific type of project. More than one grant or loan may be appropriate for a proposed activity. Completing the LHMP will facilitate and obtain grant funding in the future. For instance,

Hazard Mitigation Grant Program (HMGP), or Flood Mitigation Assistance (FMA) grants. Grant opportunities will be reviewed each year to ensure there will be funding available for specific mitigation items.

5.7 Capabilities Assessment

A Capability Assessment examines LHHCWD's capabilities to detect any existing gaps or weaknesses within ongoing activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. The conclusions of the Risk Assessment and Capability Assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. The list below outlines key capabilities LHHCWD will consider in the Mitigation Strategy.

1. At a Board of Directors meeting in July. The Board approved signing a contract with an outside firm to help the District with GIS.
2. Add funding for hazard mitigation actions to the District's Capital Improvement Plan planning efforts.
3. Incorporate projects from the Capital Improvement Plan into the mitigation strategy (and vice versa).
4. Expand Public outreach and education on emergency management. This allows LHHCWD to form a plan to continually educate their customers regarding natural hazards and the effects these hazards have on drinking water systems. They educate the residents on the importance of mitigating these hazards to build a more resilient community.
5. Broaden staff training: LHHCWD employees have experience with past hazard mitigation and hazard planning and can improve their hazard mitigation skills by participating in training offered by other agencies or other regional governments. This plan should continue with the LHHCWD website

SECTION 6. MITIGATION STRATEGIES

6.1 Overview

LHHCWD derived its mitigation strategy from the 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 system for the future. This vision is based on informed assumptions that recognize both mitigation challenges and opportunities and is demonstrated by the goals and objectives outlined below. Additionally, the mitigation measures identified under each objective include an implementation plan for each measure. The measures were individually evaluated during discussions of mitigation alternatives, and the conclusions were used as inputs when priorities were decided. All priorities are based on the consensus of the Planning Team.

Mitigation measures are categorized generally for all hazards and specifically for the five high-risk hazards that were extensively examined in the risk assessment section. These hazards include earthquakes, wildfire, landslides, windstorms, and climate change–induced drought.

6.2 Mitigation Goals, Objectives, and Projects

The process of identifying goals began with a review and validation of the FEMA Hazard Maps for LHHCWD and its surrounding cities. The team completed an assessment and discussion of whether each of the goals was valid. These discussions led to the opportunity to identify Goals and Objectives. In reviewing the mitigation objectives and actions, it was the Planning Team's consensus that the following goals should be included in the LHMP.

Overall, the primary objective is to protect lives and prevent damage to infrastructure that disrupts water services. Global measures that apply across all hazards include:

- Continually improve the community's understanding of potential impacts due to hazards and the measures needed to protect lives and critical infrastructure.
- LHHCWD communications should provide public outreach to inform the public of the hazards identified to the drinking water system in emergencies, such as how to conserve water in the event of a disaster and how to obtain drinking water when water may not be available.
- Continually provide State and Local Agencies with updated information about hazards, vulnerabilities, and mitigation measures at LHHCWD.
- Review and verify that the District-owned and operated infrastructure meets the minimum standards for safety.

- Review the District's facilities and developments in high-risk areas to verify that these areas are appropriately protected from potential hazards.
- Identify and mitigate imminent threats to life safety and facility damage.
- The five high-profile hazards for LHHCWD are earthquakes, wildfire, landslides, windstorms, and climate change–induced drought. While other hazards were profiled in previous sections, LHHCWD's priority and focus for the mitigation projects will be on the five high-profile hazards.

The table below shows the status of mitigation actions from the 2022 LHMP.

Hazard	2022 Mitigation Action	Status
Earthquake	1. Flexible pipe joints at wellheads, pump stations, and reservoirs $1.5 Million (2 Years) Operations Manager/ General Manager. HMGP, BRIC. High. 2. Seismic shut-off valves $1 Million (2 Years) Operations Manager/ General Manager. HMGP, BRIC. High. 3. Tie-down equipment $10,000 (1 Year) Operations Manager. HMGP, CIP. Medium.	1. 10A reservoir has been completed, 2024. Continued efforts for other wellheads, pump stations, reservoirs. 2. No update, continued mitigation project for 2025 HMP. 3. Ongoing, continued mitigation project for 2025 HMP.
Wildfire	1. Install Heli-Hydrant, $2.3 Million (2 years) General Manager. HMGP, BRIC. High. 2. Fire Education Programs, $20,000 (Annual) General Manager, HMGP, CIP. Medium. 3. Clear trees and brush 25 feet from all facilities, $30,000 (Annual) Operations Manager. HMGP, CIP. Medium. 4. Retrofit all paint and tank coating to fire-retardant, $5 Million. (3 Years)	1. Installed - completed 2023 2. Continued – occurs annually, continued mitigation project for 2025 HMP. 3. Continued – occurs annually, continued mitigation project for 2025 HMP. 4. Completed work at all facilities in August of 2023 and again in June 2024, continued mitigation project for 2025 HMP.

	Operations Manager. HMGP, BRIC. Medium. 5. Foster better communication programs with the fire department $5,000 (Annual) General Manager. CIP. Medium. 6. Develop a refueling plan for generators, $3,000 (Semi-annual) Operations Manager. CIP. High. 7. Install generators at all booster stations, $1 million (3 Years) Medium, Operations Manager. HMGP, BRIC.	5. Ongoing, continued mitigation project for 2025 HMP. 6. Plan has been developed but will be updated to include diesel fuel tank transportation, continued mitigation project for 2025 HMP. 7. No update, continued mitigation project for 2025 HMP.
Landslides	1. Planting for soil stabilization near steep slopes $25,000 (Annual) Operations Manager. HMGP, BRIC. Medium. 2. Slope drainage systems $1 Million (3 Year) Operation Manager, General Manager. HMGP, BRIC. High.	1. Ongoing, continued mitigation project for 2025 HMP. 2. Ongoing, continued mitigation project for 2025 HMP.
Windstorms	1. Install generators at wells and booster stations $1 Million (3 years) Operation Manager. HMGP, BRIC. Medium. 2. Develop customers notification on water conservation during events $5,000 (Annual) General Manager. High. 3. Develop better communication with SCE $5,000 (Annual) General Manager. CIP. High.	1. No update, continued mitigation project for 2025 HMP. 2. Put together a Water Contingency Plan 2024. Ongoing, continued mitigation project for 2025 HMP. 3. Ongoing, continued mitigation project for 2025 HMP.
Drought	1. Drill new wells $3 Million (5 Years) General Manager. HMGP, BRIC. High. 2. Improve operational efficiency system leaks $1 Million (5 Years)	1. No update. continued mitigation project for 2025 HMP. 2. No update, continued mitigation project for 2025 HMP.

	Operations Manager. HMGP, BRIC, CIP. High. 3. Water conservation $25,000 (1 Year) Operations Manager. CIP. Low. 4. Increase water pumping capabilities $1.5 Million (2 Years) General Manager. BRIC, HMGP. Medium. 5. Study system interties with other water systems in the area $50,000 (1 year) General Manager. CIP, HMGP. High.	3. Ongoing, as needed. Continued mitigation project for 2025 HMP. 4. Maintenance updates allowing more efficient pumping. This is ongoing, continued mitigation project for 2025 HMP. 5. No updates, continued mitigation project for 2025 HMP.

6.3 Wildfire

Goal: To protect life and property in La Habra Heights County Water District in the event of a wildfire.

Description: The goal is to avoid injury, loss of life, and property damage and to maintain water flow for firefighting efforts. LHHCWD knows it is a matter of time before the hills in the service area have a major fire. The only hope is that this fire does not happen during Santa Ana wind conditions, as this condition will drive the fire down into the neighborhoods from the hills.

Mitigation Projects: Below is the project's priority, the department responsible for this action and the funding source. Further analysis will be required for each mitigation project to provide a more accurate cost estimate when ready to implement. All the actions listed for each hazard were the only actions considered by LHHCWD. As LHHCWD is a community facing economic challenges, the District and its board must adhere to a stringent budget. Consequently, the District must seek opportunities to save costs or secure grants to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- Fire Education Programs, $20,000 (Annual) General Manager, HMGP, CIP. Medium.
- Retrofit all paint and tank coating to fire-retardant, $5 Million. (3 Years) Operations Manager. HMGP. Medium.
- Foster better communication programs with the fire department $5,000 (Annual) General Manager. CIP. Medium

- Remove brush and trees from around facilities. $30,000 (Annual). High Priority. Superintendent. Operational budget.
- Replace water distribution main feeding the City of La Habra Heights Heli-Hydrant Tank $2.5 Million General Manager. HMGP and CIP.
- Retrofitting plant #5 to withstand wildfire Build block structure around plant 5, increasing fire resiliency and security. High Priority. (5 Years) $500,000. General Manager. HMGP and CIP.
- Reservoir 5A and 10A retrofitting SCADA communications $40,000 (5 years) High Priority. General Manager. HMGP and CIP.
- Burry communications line deeper, currently 4-5 inches need at least 18 inches deeper $250,000. (5 years) High Priority. General Manager. HMGP and CIP.
- Install generators at all booster stations, $2 million (5 Years) Medium, General Manager. HMGP and CIP.

6.4 Earthquake

Goal: To protect life and property in La Habra Heights County Water District in the event of an earthquake.

Description: The goal is to avoid injury, loss of life, and damage to property. Southern California is susceptible to earthquakes because there are many earthquake faults dissecting the state.

Mitigation Projects: Below is the project's priority, the District is responsible for this action, and the source of funding. Further analysis will be required for each mitigation project to provide a more accurate cost estimate when ready to implement. All the actions listed for each hazard were the only actions considered by LHHCWD. The District and its board are required to adhere to a stringent budget. Consequently, the District must seek opportunities to save costs or secure grants to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- Flexible pipe joints at wellheads, pump stations, and reservoirs $1.5 Million (5 Years) General Manager. HMGP. High priority.
- Seismic shut-off valves $1 Million (5 Years) General Manager. HMGP. High priority.
- Tie-down equipment $10,000 (5 Year) Operations Manager. HMGP, CIP. Medium priority.

6.5 Landslides

Goal: To protect life and property in La Habra Heights County Water District in the event of landslides.

Description: The goal is to avoid injury, loss of life, and property damage. A localized landslide of great volume is typically caused by unusually heavy rain in a semiarid area. Landslides can reach their peak volume in a matter of a few minutes and often carry large loads of mud and rock fragments.

Mitigation Projects: Below is the project's priority, the department responsible for this action, and the funding source. Further analysis will be required for each mitigation project to provide a more accurate cost estimate when ready to implement. All the actions listed for each hazard were the only actions considered by LHHCWD. As LHHCWD is a community facing economic challenges, the District and its board must adhere to a stringent budget. Consequently, the District must seek opportunities to save costs or secure grants to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- Install new valves on cross-country mainlines to mitigate landslides. Field operations, $300,000. General Manager. High priority. HMGP and CIP.
- Planting for soil stabilization near steep slopes $25,000 (Annual) Operations Manager. HMGP. Medium.
- Slope drainage systems $1 Million (5 Years) Operation Manager, General Manager. HMGP. High.

6.6 Windstorm

Goal: To protect life and property in La Habra Heights County Water District in the event of windstorms.

Description: The goal is to avoid injury, loss of life, and property damage. The Santa Ana winds are notorious in Southern California for wreaking havoc during the fall and winter months each year. The winds are known for their hot, dry weather and bring the lowest relative humidity of the year. The Santa Ana winds easily reach over 40 miles per hour with a gust of over 60 miles per hour. These winds topple trees and power lines, start wildfires, and cause havoc throughout the region. This has caused Southern California Edison and other power providers in California to cut power in regions during these wind events, which are called Public Safety Power Shutoff (PSPS) events.

Mitigation Projects: Below you will find the priority of the project, the department responsible for this action, as well as the source of funding. Further analysis will be required for each mitigation project to provide a more accurate cost estimate when ready to implement. The identified projects and current cost estimates include:

- Develop customer notification on water conservation during events $5,000 (Annual) General Manager. High.

- Develop better communication with SCE $5,000 (Annual) General Manager. CIP. High.
- Permanent on-site Emergency Generator hookups and automatic transfer panels. Mitigation of loss of power allows wells, boosters, and pumps to keep water in the system. $2 million. General Manager. High priority. CIP and HMGP
- SCADA satellite back-up communications connections. Mitigation of loss of power allows wells, boosters, and pumps to keep water in the system. General Manager. $250,000. (5 Years) High priority.

6.7 Climate Change – Induced Drought

Goal: To protect life and property in La Habra Heights County Water District in the event of a drought.

Description: The goal is to avoid injury, loss of life, and damage to property. Due to Climate Change, there are more extremes in the weather, which means the summers can be hotter, the winters colder, and periods of rain can become less wet or wetter, which causes flooding. It is expected that there will be greater fluctuations in weather patterns, including prolonged dry periods and drought hazards, which can be mitigated over the long term.

Mitigation Projects: Below is the project's priority, the department responsible for this action, and the funding source. Further analysis will be required for each mitigation project to provide a more accurate cost estimate when ready to implement. All the actions listed for each hazard were the only actions considered by LHHCWD. As LHHCWD is a community facing economic challenges, the District and its board must adhere to a stringent budget. Consequently, the District must seek opportunities to save costs or secure grants to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- Improve operational efficiency system leaks $1 Million (5 Years) Operations Manager. HMGP, CIP. High.
- Water conservation $25,000 (1 Year) Operations Manager. CIP. Low.
- Increase water pumping capabilities $1.5 Million (5 Years) General Manager. HMGP. Medium.
- Study system inter-ties with other water systems in the area $100,000 (2 year) General Manager. CIP, HMGP. High.
- Replace aging infrastructure prone to leaks. Improving pipeline and leak surveys. $2 Million (5 Years) General Manager. HMGP and CIP. High priority.
- Drill new wells $5 Million (5 Years) General Manager. HMGP. High.

6.8 Mitigation Priorities

During the development of the risk assessment for LHHCWD, the Planning Team proposed and discussed alternative mitigation goals, objectives, and specific mitigation measures that LHHCWD should undertake to reduce the risk from the five high-risk hazards facing the District. Priorities from the 2022 LHMP have not changed for the 2025 plan. The team considered multiple factors to establish the mitigation priorities included in this plan. It assigned the highest priority rankings to those mitigation measures that met three primary criteria:

- Greatest potential for protecting life and safety
- Greatest potential for maintaining critical District functions and operability following a disaster
- Achievability in terms of residents' support and cost-effectiveness

All rankings were determined by the consensus of the Planning Team. As described in the previous section on hazard and risk assessment, earthquakes have the potential to affect the largest number of people, damage critical facilities and buildings, and cause the greatest economic losses. This fact, combined with the relatively high probability of an earthquake occurrence in the next several decades, makes increasing disaster resistance and readiness for earthquakes a high priority. Given the extreme importance of maintaining critical functions in times of disaster and the large number of customers who depend and rely on LHHCWD services and infrastructure, those mitigation measures that improve disaster resistance, readiness, or recovery capacity are generally given higher priority.

Earthquakes, wildfire, landslides, windstorm, and climate change–induced drought mitigation actions are identified and assigned a priority according to their importance, cost, funding availability, the degree to which project planning has been completed, and the anticipated time to implement the measures.

Using the above rationale for establishing mitigation priorities, each mitigation measure is assigned a priority ranking as follows:

- High – Projects that will be the primary focus of implementation over the next five years.
- Medium – Projects that may be implemented over the next five years.
- Low – Projects that will not be implemented over the next five years unless conditions change (new program and funding source).

6.9 Implementation Strategy

The implementation strategy is intended to successfully mitigate the hazards identified in this plan within a reasonable time. LHHCWD is currently operating within its annual budget. LHHCWD revenues and capital improvement projects have remained a priority. LHHCWD planning team will review the Hazard Mitigation Plan each year before developing the next year's fiscal budget. The plan will also be reviewed by the Board of Directors for items to be included in the new fiscal budget. The LHHCWD staff will also actively explore opportunities to secure Hazard Mitigation Grants annually to mitigate the effects on the fiscal budget and provide some relief to the residents. The following equation is the cost-benefit analysis equation used to ensure that the cost-benefit to the District is within FEMA guidelines. When completing a cost-benefit analysis,(shown below) with FEMA, the formula is all in electronic form but resembles the formula below.

$$B/C = \left[\frac{B_0}{(1+i)^0} + \ldots + \frac{B_T}{(1+i)^T}\right] \div \left[\frac{C_0}{(1+i)^0} + \ldots + \frac{C_T}{(1+i)^T}\right]$$

Mitigation Projects Funding Source

There is currently no mitigation money in the District's budget. The District will include mitigation into the budgeting process when funding becomes available and look at what mitigation projects could be funded in future budget cycles.

Timeframe

Over the next five years, the District will incorporate mitigation into all capital improvement projects that it undertakes. The previous 2022 LHMP was incorporated in the CIP and any other relevant planning mechanisms, including the Water Master Plan, which incorporates LHMP mitigation projects.

The District will apply for mitigation grants as the opportunities become available in the State of California and the County of Los Angeles each year. The District will consider all mitigation items during the review of the Five-Year Capital Improvement Plan and during the annual budget workshops.

SECTION 7. PLAN MAINTENANCE

7.1 Monitoring, Evaluating, and Updating the Plan

The General Manager will evaluate the plan annually and consider whether new hazards have emerged, community vulnerability has changed, and goals are still relevant to current conditions. This will be tracked by evaluating and recording completed mitigation actions and adding mitigation projects to the current LHMP. The LHMP will be reviewed as part of the annual budget planning each year and whenever new infrastructure updates are made within LHHCWD. The General Manager will ensure the LHMP is reviewed annually, and any items that have been mitigated will be recorded and tracked within the LHMP. At that time, staff and the Board of Directors will review funding and capital improvement replacement projects in the next fiscal year's budget. Annually, the General Manager will review funding and determine the projects to be included in the next fiscal year's Capital Improvement Plan budget.

The General Manager will include the LHMP in all budget planning and grant planning meetings. This will allow open discussion, evaluation, and assessment of the LHMP to achieve goals, allowing the addition and removal of mitigated items. The General Manager leads a full review of the LHMP at a three-and-a-half-year interval like the initial LHMP. At this time, the planning team including the General Manager will address progress in reaching mitigation goals, assessment of new and existing hazards, using the new revised FEMA review tool, cross referencing hazards from the county, and development of new mitigation strategies and goals.

The consumers within LHHCWD will be asked to participate in the LHMP update process. There has not been any substantial development within the service area in the last 5 years

7.2 Implementation through Existing Programs

Once the State of California OES and FEMA approve the LHMP, LHHCWD will incorporate the LHMP into capital improvement replacement projects, capital replacement programs, building design, and any updates or repairs to the water distribution system. Information gathered from hazard profiles, such as the hazard maps and facility vulnerabilities, will be used as a resource document and support the plans, projects, and programs that will benefit the water system and building within the service area. LHHCWD will submit a Notice of Intent to the State of California to help facilitate opportunities to obtain FEMA and state funding to mitigate hazards within the water system. The General Manager will be responsible for implementing the LHMP and working toward the LHMP-recommended goals and objectives that are met. The General

Manager will be responsible for placing the LHMP on the LHHCWD website and incorporating the LHMP into the annual budget planning meetings. The General Manager will verify that the LHMP is updated and rewritten over a 5-year cycle. LHHCWD will start the update process one and a half years before the expiration date on this document.

7.3 Continued Public Involvement

The approved LHMP will be continuously posted with contact information on the LHHCWD's Website. The General Manager is responsible for ensuring the LHMP is brought before the Board of Directors each year during Budget Planning. Public comments will be taken regarding the LHMP when the plan is updated in 2029, and projects that could be included in next year's budget will be considered. As new facilities are incorporated into LHHCWD, the LHMP will be updated to include new facilities and new hazards, if warranted. When the LHMP is rewritten and updated, the public can review it and coincide with the document's changes. It is the General Manager responsibility to ensure the LHMP is updated throughout the year and every 5 years.

The plan is reviewed annually by LHHCWD. The General Manager will conduct outreach with the nonprofit organizations, including community-based organizations, to represent the community's input into the updates. LHHCWD can also learn how community priorities have changed since the last update by conducting outreach to the public on construction, infrastructure improvements, and overall abilities.

Appendix A: Planning Team Meeting Matrix

Meeting Matrix / Attendees	4/15/25 Kickoff Meeting (In-Person)	5/15/25 Working Session (Zoom	6/25/25 Working Session (Zoom	7/16/25 Working Session (Zoom)	8/19/25 Final Planning Meeting (In-Person)
Joe Matthews, General Manager	x	x	x	x	x
Ivan Ramirez, Superintendent	x	x	x	x	x
Karen Baroldi, Board of Directors		x	x	x	x
Gary Sturdivan	x	x	x	x	x
Deanna Allstun			x	x	x
Ryan Jorgensen	x	x	x	x	

Appendix B: Public Outreach

(Insert screenshot of HMP posted on LHHCWD website)