

2024



# Joshua Basin Water District Local Hazard Mitigation Plan Update

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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 latest 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 Local Hazard Mitigation Plan is an update of the Joshua Basin Water District’s Hazard Mitigation Plan under review by the Federal Emergency Management Agency (FEMA).

### **1.1 PURPOSE OF THE PLAN**

The intent of hazard mitigation is to reduce and/or eliminate loss of life and property. Hazard mitigation is defined by FEMA 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 purpose of the Local Hazard Mitigation Plan is to demonstrate the plan for reducing and/or eliminating risk in Joshua Basin Water District’s service area. The LHMP process encourages communities to develop goals and projects to reduce risk and build a more disaster-resilient community by analyzing potential hazards.

After disasters, repairs and reconstruction are often completed to 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 a primary phase of emergency management dedicated to breaking the cycle of damage. Hazard mitigation is distinguished from other disaster management functions by measures that make JBWD infrastructure development and the natural environment safer and more disaster resilient. Mitigation generally involves the alteration of physical environments, significantly reducing risks and vulnerability to hazards by altering the built environment so that life and property losses can be avoided or reduced. Mitigation also makes responding to and recovering from disasters easier and less expensive.

With an approved (and adopted) LHMP, Joshua Basin 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 the “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 (HMP) 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, 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, require the safety element to be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to that city or county.

JBWD's legal jurisdiction encompasses serving water to the Joshua Tree area in the unincorporated area of San Bernardino County, California, known as the Hi-Desert. JBWD is approximately ½ hour's drive from the low desert region of Palm Springs. The Water District has legal authority for infrastructure, pipelines, wells, and water storage to serve this purpose. JBWD does not have legal authority for zoning, land use, new construction, planning, building inspections, or codes. These functions are assigned to San Bernardino County.

### 1.3 WHAT'S NEW

The 2018 Joshua Basin Water District Hazard Mitigation Plan contained a detailed description of the planning process, a risk assessment of identified hazards for the JBWD Service Area, and an overall mitigation strategy for reducing the risk and vulnerability of these hazards. Since FEMA's approval of the plan, progress has been made by JBWD on the mitigation strategy. As part of this 2024 LHMP update, a thorough review and update of the 2018 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. Completing this 2024 LHMP update further provides documentation of the JBWD's continued commitment and engagement in the mitigation planning process.

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 relating to the JBWD 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 2024 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.

**2018 Mitigation Strategy Status and Successes.** Section 1.5 describes the status of mitigation actions from the 2018 plan and indicates whether a project is no longer relevant or recommended for inclusion in the updated 2024 mitigation strategy.

## 1.4 NEW RISK ASSESSMENT

As part of its comprehensive review and update of each section of the plan, JBWD 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 sourced in context within Chapter 4, Risk Assessment. Specific data used is sourced throughout this plan document. This new data and associated analysis provided valuable input for the development of the mitigation strategy presented in Chapter 5 of this plan. A highlight of latest information and analyses contained in this plan update includes the following:

- A new assessment of updated hazards affecting the JBWD area was completed, adding additional hazards to the planning documents. New hazards include climate change, drought, and terrorism.
- An entire rework of the risk assessment for each identified hazard was completed. This included reworking the hazard profile and adding new hazard event occurrences, revising 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 was completed, including 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 flood, wildfire, and earthquake hazards.

Terrorism is now a reoccurring possibility within the United States due to the terror attack in San Bernardino County in December of 2015; a hazard profile on this matter has been added to this plan.

## 1.5 SUCCESSFUL MITIGATION IMPLEMENTATION

JBWD has completed a review of past seismic retrofit studies and has applied studies to current and future projects. JBWD also participates annually with the Great California Shakeout to prepare and train employees for earthquakes.

- The District Office and Shop security camera systems were upgraded in 2019 as a mitigation effort to enhance security.
- SCADA Server security cameras were installed in 2019 for cyber security and increased online and physical security.

- Due to issues with faulty shafts, bowls, and lining, and to mitigate potable water contamination concerns, Well 14 underwent complete rehabilitation, which was completed in 2023.
- D-1-1 Booster Station underwent complete rehabilitation in 2023, including replacing the motor and booster pump and increasing security.

Approximately six years ago, Twentynine Palms Water District and Joshua Basin Water District collaborated on drafting and successfully obtaining a grant to construct an intertie. However, California Transportation (Caltrans) expressed interest in having the pipeline reinforced with concrete during the planning process, significantly driving up the project cost. As a result, Twentynine Palms Water District and Joshua Basin Water District made the difficult decision to decline the grant due to the financial burden associated with the enhanced construction. Consequently, the grant was returned to CalOES and FEMA.

## PHYSICAL SETTING

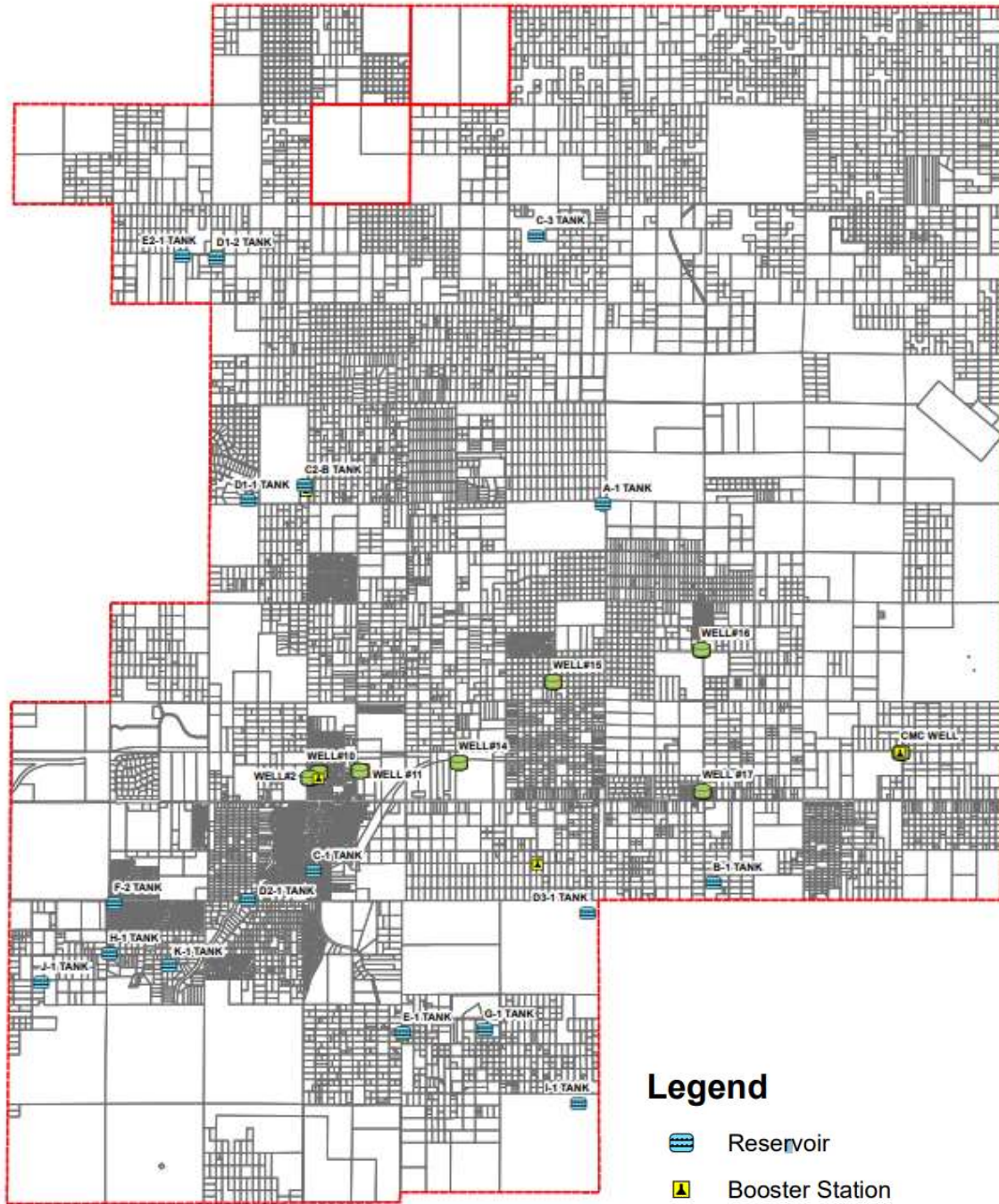
Joshua Basin Water District (JBWD) is a distinct community located in the Hi-Desert region along the southern border of the Mojave Desert in San Bernardino County. It is situated just north of the Little San Bernardino and Pinto Mountains, 35 miles north of Palm Springs, California, at an elevation ranging from 2,280 to 4,920 feet above sea level. The Joshua Tree region is recognized for its exceptional underground water quality, pristine air, and clear skies. JBWD is situated between Joshua Tree National Park and the Twentynine Palms Marine Corps Air Ground Combat Center to the northeast. Additionally, JBWD shares boundaries with three nearby water districts: Bighorn Desert View Water District to the north, Twentynine Palms Water District to the east, and Hi-Desert Water District to the south. JBWD maintains an intertie with the neighboring Hi-Desert Water District. It is worth noting that there is currently no intertie between Twentynine Palms Water District and Joshua Basin Water District.

The Little San Bernardino Mountains and Joshua Tree National Park are located south of JBWD. The well-known San Andreas Fault runs just south of the district, with the Blue Cut Fault running parallel to Highway 62. The Pinto Mountain Fault also runs north of the district's service area.






The region experiences high temperatures during the summer months and extreme cold in the winter months, sometimes resulting in snowfall. The Hi-Desert area is susceptible to flooding, leading to occasional road closures, particularly on the main roadway, Highway 62. Another route in and out of the valley is Highway 247, which runs north to connect to Highways 40 and 15.

Figure 1. JBWD Service Map

# Joshua Basin Water District



### Legend

-  Reservoir
-  Booster Station
-  Well
-  Boundary
-  Parcels





## HISTORY

The Joshua Basin Water District (JBWD) was established in 1963 through the consolidation of multiple small private water providers in the region. The District acquired several of these smaller suppliers, officially establishing itself as a Special District in accordance with California Water Code Section 3000 et seq. (County Water District Law). The governance of the District is overseen by a five-member Board of Directors, elected at-large from within the District's service area.

The Board of Directors has appointed a General Manager who oversees the District's day-to-day operations. The District experienced significant growth during the 1950-1970 period but has since seen limited expansion until the recent re-discovery of Joshua Tree National Park. As a result, the park and its surrounding area have become a popular destination for leisure activities and appreciating unspoiled natural beauty. This increased popularity has led to a seasonal influx of visitors to the Joshua Tree region, particularly during the spring, summer, and fall. Consequently, there is a notable presence of short-term rentals in Joshua Tree.

The District currently owns and operates 17 above-ground water reservoirs, 5 active producing wells, 1,426 fire hydrants, 4,700 water meters, a hydro-pump pressure station, and several water pressure reduction stations. JBWD also maintains and manages several recharge ponds and a wastewater treatment plant facility used by the local hospital, Hi-Desert Medical Center.

## 1.6 CLIMATE

The average rainfall<sup>1</sup> for Joshua Tree, where the main office and the operations shop facility are located, is 2.66 inches, with the most rain falling from January through March each year. With average temperatures ranging from 37 – 100 degrees Fahrenheit. The region's temperate Mediterranean climate fosters moderate winters, warm summers, and generally low humidity.

**Table 1. Average Max and Min Temp and Total Precipitation within the Joshua Tree**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<b>Avg. Max. Temp (F)</b>	60	64	70	77	86	95	100	99	93	82	69	60	100.4 F
<b>Avg. Min. Temp (F)</b>	37	39	42	45	54	60	69	68	64	52	43	35	66.6 F
<b>Avg. Total Precipitation</b>	0.77	0.82	0.60	0.10	0.33	0.04	0.24	0.55	0.34	0.39	0.64	0.29	2.48 in

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<sup>1</sup> Average weather Joshua Tree 2008-2019 normal US Climate Data  
<https://www.usclimatedata.com/climate/joshua-tree/california/united-states/usca1645>

## 1.7 DEMOGRAPHICS

According to the 2020 Census, the unincorporated area of San Bernardino County, specifically the Joshua Tree area, is home to a population of 7,567 residents. The median age of this population is reported to be 40.2 years old. Of this, 45.88% are males and 54.12% are females. US-born citizens make up 89.69% of the resident pool in Joshua Tree, while non-US-born citizens account for 6.99%. Additionally, 3.33% of the population is represented by non-citizens. 6,223 people in Joshua Tree live in the same house as last year.

White-collar workers make up 78.82% of the working population in Joshua Tree, while blue-collar employees account for 21.18%. There are also 618 entrepreneurs in Joshua Tree (21.71% of the workforce), 1,551 workers employed in private companies (54.48%), and 607 people working in governmental institutions (21.32%).

There are 2,904 households in Joshua Tree, each comprising approximately two members. Family establishments represent 53.89% of these Joshua Tree households, while non-family units account for the remaining 46.11%. Additionally, 25.83% of households have children, and 74.17% of households are without children. No development changes since the 2018 LHMP affected the jurisdiction's overall vulnerability. Along with no changes to the community's priorities since the 2018 LHMP.

The average annual household income in Joshua Tree is \$54,678, while the median household income sits at \$31,173 per year.

Joshua Basin Water District service area demographics specifics:

- **Population:** 7,414
- **Area:** 96 sq. miles
- **Elevation:** 2,959.65 ft

The County of San Bernardino will work with JBWD on any future zoning or plans within its service area. JBWD will issue "Will Serve Letter" to the County and/or developer if JBWD determines it has the resources to serve the projected development and whether it will cause any impact to the identified hazards. Any future fluctuation in the population pattern within the service area will not cause any significant impact to JBWD and the listed identified hazards. If JBWD accepts the request, they will follow the existing regulations to ensure that there will be no change in impact to JBWD for all future hazards. If JBWD denies the request, the development will use a different water source, thus also not changing impacts on JBWD for all future hazards.

## **SECTION 2. PLAN ADOPTION**

### **2.1 ADOPTION BY LOCAL GOVERNING BODY**

Pursuant to the mitigation planning regulations, Joshua Basin Water District LHMP will be submitted to the California Office of Emergency Services (Cal EOS) for review and approval. Cal OES will conduct a review of the Plan in accordance with the Code of Federal Regulations; once this review is complete and any revisions are made, CalOES will forward the plan to FEMA for another review and revisions, as FEMA requires. CalOES will notify JBWD when FEMA has approved the final LHMP. The final approval letter will be pending adoption by the District's Board of Directors. The Board of Directors' resolution will be sent to CalOES and FEMA. SEMC will send a copy of the LHMP and Resolution to the San Bernardino Office of Emergency Management.

### **2.2 PROMULGATION AUTHORITY**

The Promulgator Authority for the adoption of the Hazard Mitigation Plan Joshua Basin Water District and the Board of Directors and incorporation of the LHMP into the San Bernardino County Operational Area Multi-Jurisdictional General Plan is:

**Tom Floen – President**

Representing Division 4

**Stacy Doolittle – Vice President**

Representing Division 5

**Jane Jarlsberg – Director**

Representing Division 3

**Tomas Short – Director**

Representing Division 1

**David Fick – Director**

Representing Division 2

### Primary Point of Contact

The Point of Contact for information regarding this LHMP is:

**Sarah Johnson (General Manager)**

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## SECTION 3. PLANNING PROCESS

### 3.1 PREPARING FOR THE PLAN

JBWD developed a broad approach in preparing its hazard mitigation plan update. As an active participant in the County of San Bernardino's Multi-Hazard Multi-Jurisdictional Mitigation Plan, JBWD used the county-provided resources to assist in developing and evaluating data to start the plan update.

Internally, JBWD has a wealth of experienced and resourceful employees who provide benefits to the program. The JBWD team participated in regular discussions, staff meetings, and health and safety meetings supporting the plan update. The JBWD team was invited to the meeting through emails and the Microsoft Outlook calendar. Members of this team also participated in community outreach events such as fairs and local events/meetings and provided public education.

In addition to participating at the County level, JBWD staff participated in plan updates with local agencies undergoing plan updates. This included staff from Hi-Desert Water District and Twenty-nine Palms Water District; 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 through fairs and events.

Organizations within or surrounding JBWD service boundaries that conduct outreach and assistance for vulnerable populations include the Morongo Oasis Center Crisis Residential Treatment (CRT), Morongo Basin Align Resources Challenging Homelessness, American Red Cross – American Red Cross Chapter San Bernardino, and Joshua Tree Community Center. Underserved and vulnerable populations they serve include people who are socioeconomically disadvantaged; 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. These local organizations were able to specialize in the community disadvantages that are found within the service area such as homeless, and other well-being initiatives that aids awareness and education to the public on fentanyl and controlled substances, and alcohol abuse.

The District's approach to updating the plan consisted of the following:

- Establishing the internal planning team
- Coordination with outside agencies, organizations, jurisdictions, and the public
- Documenting past events
- Posting the meeting agendas, meeting minutes, and draft LHMP onto the JBWD 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 hazards facing the area and JBWD's mitigation goals. Relevant information from the following plans, including County government priorities, were included when aligned with JBWD strategies and projects and incorporated into the JBWD LHMP.

JBWD Urban Water Management Plan that details community water systems, water storage, water shortage, and climate change to ensure all the water agencies that take water from the local basin are all in agreement about water shortages, water replenishment, and effects of climate change on our water. The following plans were used:

**Table 2. Reference Plans Used**

Study Plan	Key Information
<b>2020 Urban Water Management Plan</b>	Land use trends, Historical Trends for water use, and local trends
<b>2018 JBWD Local Hazard Mitigation Plan</b>	Hazard Identification, Mitigation Measures
<b>USGS Golden Guardian 2008</b>	Earthquakes, Affects, Planning
<b>2020 San Bernardino County Local Hazard Mitigation Plan</b>	Land Use For Area, Future Projects
<b>2023 California HMP</b>	Goals For The State Of California
<b>San Bernardino County Flood Control</b>	Gain Information On Future Flood Control Projects
<b>FEMA Flood Insurance Study for S.B. County</b>	Flood History

The planning process consisted of:

**Figure 2. Flow Chart for Developing a Hazard Mitigation Plan**



### 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 District Planning Team:

**Sarah Johnson – General Manager**

*Description of Involvement: Internal Member of the Planning Team*

**Jeremiah Nazario – Director of Operations**

*Description of Involvement: Internal Member of the Planning Team*

**Scott Carpenter – Production Supervisor**

*Description of Involvement: Internal Member of the Planning Team*

**Lisa Thompson – Executive Assistant**

*Description of Involvement: Internal Member of the Planning Team*

**David Shook – Director of Administration**

*Description of Involvement: Internal Member of the Planning Team*

## EXTERNAL PLANNING TEAM

### **Ray Kolisz – Management Consultant**

*Description of Involvement: External Member of the Planning Team*

### **Matthew Shragge – General Manager, Twentynine Palms Water District**

*Description of Involvement: External Member of the Planning Team*

### **Ron Wortham – Director of District Services, Hi-Desert Water District**

*Description of Involvement: External Member of the Planning Team*

### **Mike Dorame – Hi-Desert Medical Center**

*Description of Involvement: External Member of the Planning Team*

### **Josh Gilliam – Hi-Desert Medical Center**

*Description of Involvement: External Member of the Planning Team*

## 3.3 COORDINATION WITH OTHER EXTERNAL JURISDICTIONS, AGENCIES, & ORGANIZATIONS

The Internal and External Planning Teams include five people from Joshua Basin Water District, two from local water agencies, two members from the local hospital, and one management consultant. The County of San Bernardino OES, Morongo Basin Community College, Joshua Tree National Park, Morongo Oasis Center Crisis Residential Treatment (CRT), Morongo Basin Align Resources Challenging Homelessness, American Red Cross – American Red Cross Chapter San Bernardino, Hi-Desert Medical Center and Joshua Tree Continuing Care Center were invited to be on the Planning Team, but they were unable to participate, apart from Hi-Desert Medical Center. However, the Joshua Tree National Park Representative reviewed the plan content and had no feedback. Appendix A contains the meeting matrix and agendas outlining the subjects covered and the attendees.

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. The District 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 the District’s website, [www.JBWD.com](http://www.JBWD.com), which allows access to the information by all participants and the public; screenshots are located under Appendix B. For questions and concerns, Mr. Gary Sturdivan’s contact information was on each document. 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 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 Local Hazard Mitigation Plan planning process
- Providing guidance for the CalOES and FEMA requirements
- Assisting in the development of regional maps and support information regarding hazards
- Providing a forum to all jurisdictions participating in the update for questions and issues to be discussed

JBWD LHMP planning staff participated in each of the scheduled stakeholder meetings and conference calls facilitated by SEMC related to the update project. See **Appendix A** for meeting attendance LHMP update.

### 3.4 PUBLIC INVOLVEMENT/OUTREACH

In order to facilitate the update of the Joshua Basin Water District's LHMP, the District sought input from the public through multiple channels. The General Manager of JBWD, Ms. Johnson, conducted outreach efforts utilizing the Constant Contact platform in order to distribute the draft copy of the LHMP to all customers with valid emails; further details can be found in Appendix B. Additionally, Ms. Johnson visited the local hospital, Hi-Desert Medical Center, and the Continuing Care Center in Joshua Tree—moreover, the draft LHMP was also posted on the official JBWD website.

These methods consist of:

- Community Outreach events
- Local Meetings and visits with local agencies
- Local Emergency Coordination meetings
- Plan/Project inclusion in the District's Programs, which includes mitigation actions that require public involvement and are open for public comment. (Capital Improvement Replacement Plan, Annual Budget Report, etc.)

Any information and public feedback that was collected from the public outreach phase, public events and meetings would be documented in **Appendix C**, including outreach to representatives of the underserved and vulnerable populations that were provided the opportunity to be involved. Any feedback collected will be evaluated and assessed to see if it should be adjudicated within the LHMP renewal. Select public comments were adjudicated into the LHMP renewal, all comments collected were recorded within **Appendix C**.

## **Annual, The Great ShakeOut Exercise**

Joshua Basin Water District participated in The Great ShakeOut. Through this plan, we provide information on disaster response related to the District's business and water. This information includes steps the District has taken to respond to earthquake emergencies that impact the District and the surrounding community.

### **3.5 ASSESS THE HAZARD**

A critical component of the LHMP process is assessing the hazards that may impact the District's facilities and operations. It is important to thoroughly understand these hazards without over-analyzing remote or highly unlikely hazards.

This LHMP has been developed through an extensive review of available information on hazards JBWD 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 as well as disasters that have happened in the District's 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, San Bernardino County hazard maps, and documents.

Additionally, for each of the profiled hazards, the JBWD 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 FEMA's HAZUS program and hazards intersect analyses recently completed within San Bernardino County to produce this information. See Section 4 for more information.

### **3.6 SET GOALS**

The goal-setting process for the 2024 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 risks the community is potentially facing, the Planning Team then re-evaluated the 2018 Hazard Mitigation Plan Goals and Objectives, assessed their status and effectiveness in meeting the 2018 Mitigation Measures, and identified new Goals and Objectives.

### **3.7 REVIEW AND PROPOSE MITIGATION MEASURES**

The process of identifying mitigation measures began with a review and validation of the previous mitigation measures in the District's 2018 Hazard Mitigation Plan. Using the existing plan as a starting point, the planning team completed an assessment of whether the measures were still valid. Through this discussion, the development of new mitigation measures was determined.

The planning team identified and analyzed mitigation measures relative to each of the hazards that influence the District. This analysis assisted the District in developing an implementation strategy

for the prioritization of mitigation measures. Meetings (in-person and virtual) were held with the planning team, both 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 of the hazards or the severity of damage from hazards was examined. The projects were identified to help ensure the implementation of 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. Preventive Activities - Zoning, building codes, stormwater ordinances.
3. Structural Projects - Detention basins, reservoirs, road, and bridge improvements
4. Property Protection - Acquisition, retrofitting
5. Emergency Services - Warning, sandbagging, road signs/closures, evacuation
6. Natural Resource Protection - Wetlands, protection, best management practices.

In addition to the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) methodology, each Stakeholder Planning Team incorporated other criteria/factor questions into the process to help engage and solicit member input.

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 impact 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 Stakeholder Planning Team had the ability to identify the higher-priority projects.

### 3.8 DRAFT THE HAZARD MITIGATION PLAN

The Project Manager drafted the JBWD Hazard Mitigation Plan Update based on input and comments provided by the Planning Team. As indicated previously, the Planning Team used the 2010, 2015, and 2020 LHMP as a starting point but revised it to reflect updated information.

The District's consultant led the Planning Team and prepared the draft LHMP with input from the Planning Team, outside water district 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 District's website. Notices were sent to all water customers in the service area via public updates and the Constant Contact platform that JBWD has at its disposal. Stating all LHMP documents were posted on the website and asked for comments.

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.

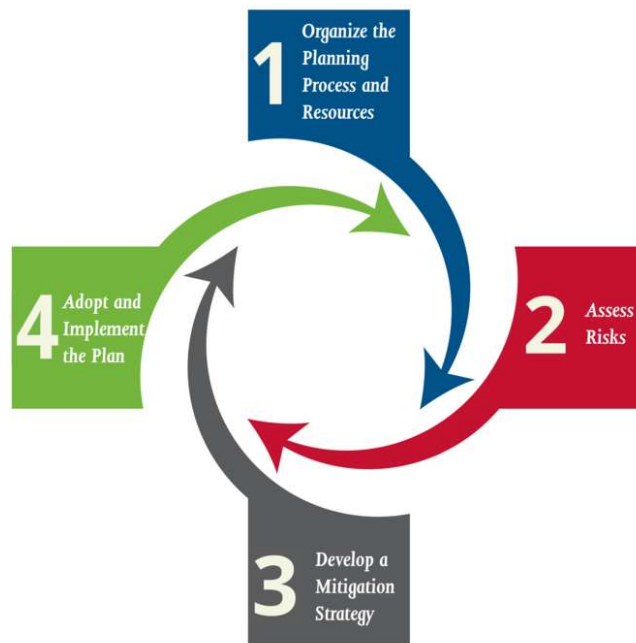
### 3.9 ADOPT THE PLAN

After the public review, the draft plan will be submitted to the State of California OES for review. Once the State has approved the LHMP, the document will be sent to FEMA by the State. When the Hazard Mitigation Plan update meets all federal requirements, FEMA will provide the District with an "Approval Pending Adoption" letter. Upon receipt of this letter, the final plan will be posted on the District's Website for a 30-day public comment period and then submitted to the Water District's Board of Directors for consideration and adoption. Once adopted, the final resolution will be submitted to FEMA for incorporation into the Local Hazard Mitigation Plan, and a copy of the resolution will be sent to CalOES and FEMA. A copy of the final LHMP will be delivered to the San Bernardino County Office of Emergency Management.

## 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.

The purpose of this section is to understand the hazards and their risks in the Joshua Basin Water District service area. This process generally has four steps: 1) Hazard Identification, 2) Vulnerability Analysis, 3) Risk Analysis, and 4) Vulnerability Assessment, including an estimation of potential losses. These are four different 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

The intent of screening the hazards is to help prioritize which hazards create the greatest concern for JBWD. 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 3.

**Table 3. Hazard Risk Rankings**

Hazard	Risk Ranking (1-4)
Earthquake	1
Climate Change – Induced Drought	2
Cyber Security	2
Flooding	3
Wildfire	3
Windstorm	4
Dam Inundation	4
Freezing events	4
Volcanoes	4
Tsunami	4
Landslides	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 JBWD for mitigation.

**Hazard Assessment Matrix**

JBWD used a qualitative ranking system for the hazard screening process, which consisted of generating a high/medium/low style of 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 for JBWD’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 4.

Prioritization of the 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 4. Screening Assessment Matrix

Probability	Impact		
	Probability/Impact Rating	<i>Catastrophic</i>	<i>Critical</i>
<i>Highly Likely (1)</i> <i>(75 – 100%)</i>	Earthquake (1)	Climate Change – Induced Drought (2)	
<i>Likely (2)</i> <i>(50-75%)</i>		Flooding (2)  Cyber Security (2)	
<i>Somewhat Likely (3)</i> <i>(25 – 50%)</i>			Wildfire (3)

### 4.3 HAZARD PROFILES

This section looks at all the hazards identified by the Planning Team that may impact JBWD within its boundaries. This section gives an overview of each hazard, the definition of each hazard, and a description of how each hazard is expected to affect JBWD’s service and/or service area using observed hazards in JBWD’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 EARTHQUAKE

**Probability:** (75-100%) Highly likely – Historical earthquake data for JBWD and its region indicate there have been at least 8 significant earthquakes within the last 14 years. However, there are earthquakes in southern California that occur daily but are insignificant to JBWD. This equates to a significant earthquake every 1.75 years on average or a 57.14 percent chance of a significant earthquake in any given year. Based on this data, JBWD 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 and identified by the Planning Team.

**Impact:** *Catastrophic*

**Priority:** *Highly Likely*

**General Definition:** An earthquake is defined as 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. As 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, electric, 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. When an earthquake occurs in a populated area, it may cause deaths, injuries, and/or extensive property damage.

Earthquakes strike suddenly at any given time of year and without warning. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world. 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 and vulnerability to earthquake hazards resulting from climate change:

**Population**– Vulnerability to earthquakes is unlikely to increase as a result of 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, in tents, or in 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, as shelter must be developed and put in place by the affected cities, counties, State, or FEMA.

Table 5 below is a replacement cost estimate for all JBWD-owned critical facilities.

**Table 5. Earthquake Magnitude Replacement Costs**

JBWD / Earthquake Magnitude		Replacement Value
<b>Magnitude 7.0 or Above (Very High Impact)</b>		
JBWD – All Critical Assets		\$800 Million
<b>Magnitude 5.0 or 6.9 (Moderate Impact)</b>		
JBWD – All Critical Assets		\$300 Million
<b>Magnitude 1.0 or 4.9 (Low Impact)</b>		
JBWD – All Critical Assets		\$5 Million

**Description:** The area around JBWD Facilities are seismically active since it is situated on the boundary between two fault lines. There have been many earthquakes in and around the District’s service area; the 1992 Landers earthquake caused over \$1 million in damage to the District.

Figure 3 . JBWD Earthquake Fault Lines

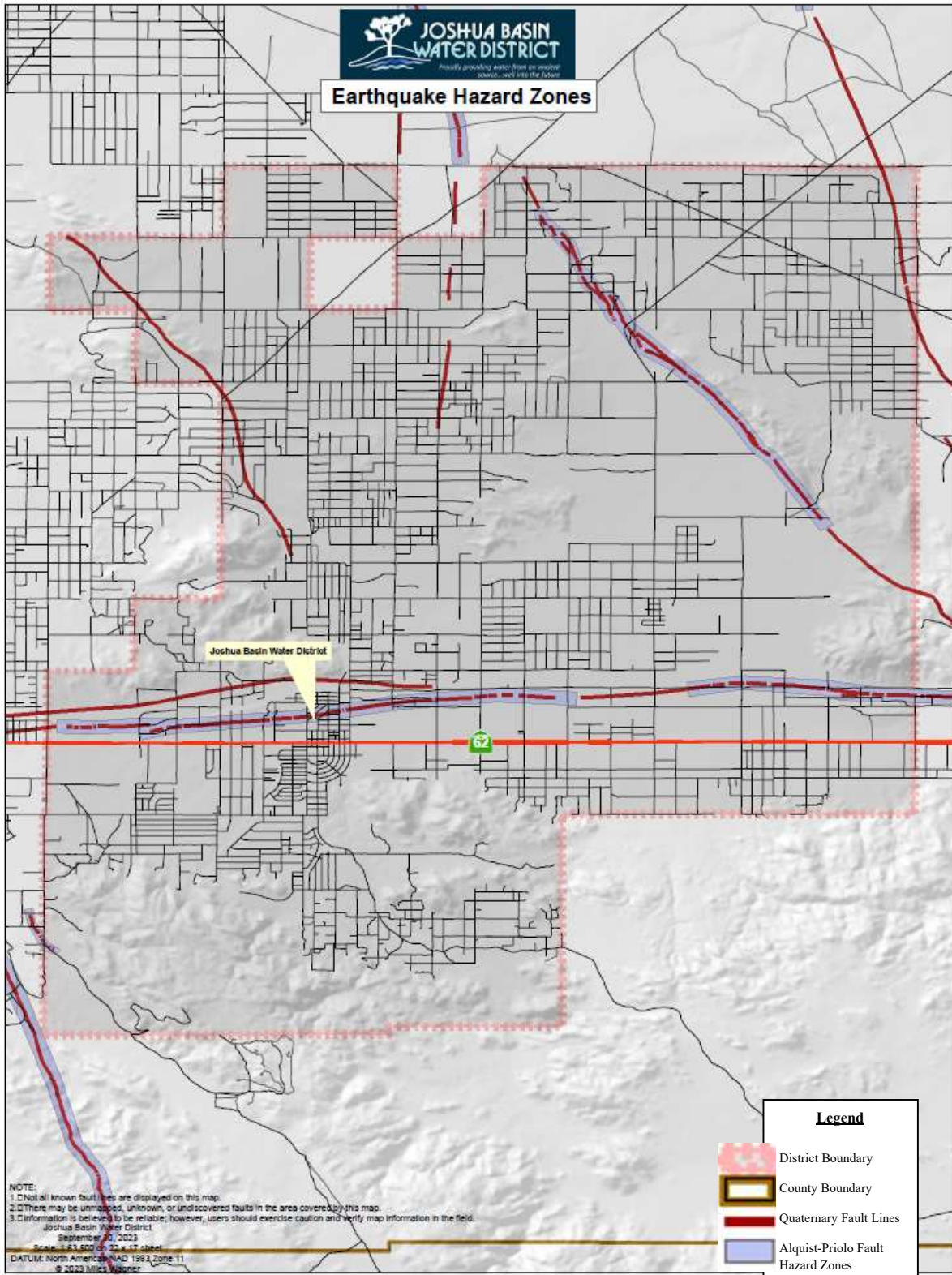


Figure 4. Joshua Basin Water District, USGS ShakeOut Map

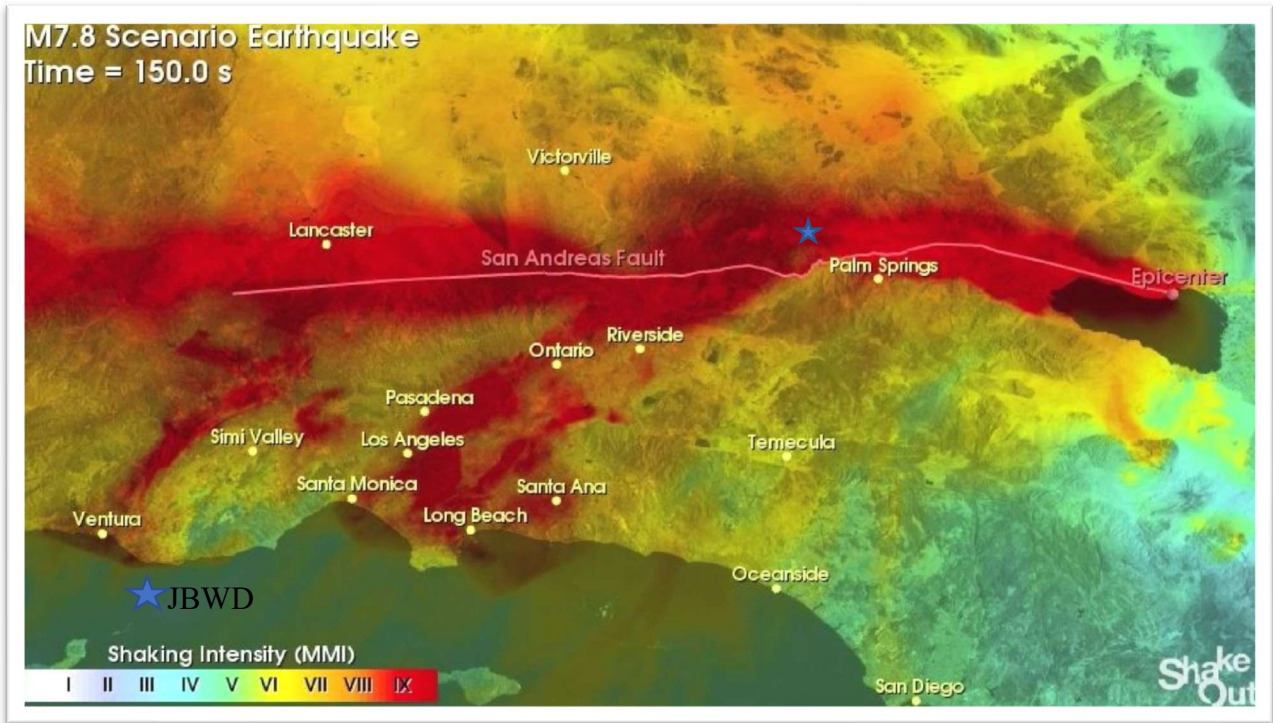


Figure 5. USGS Modified Mercalli Intensity Scale

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

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

Figure 6. United States Earthquake Hazard Map

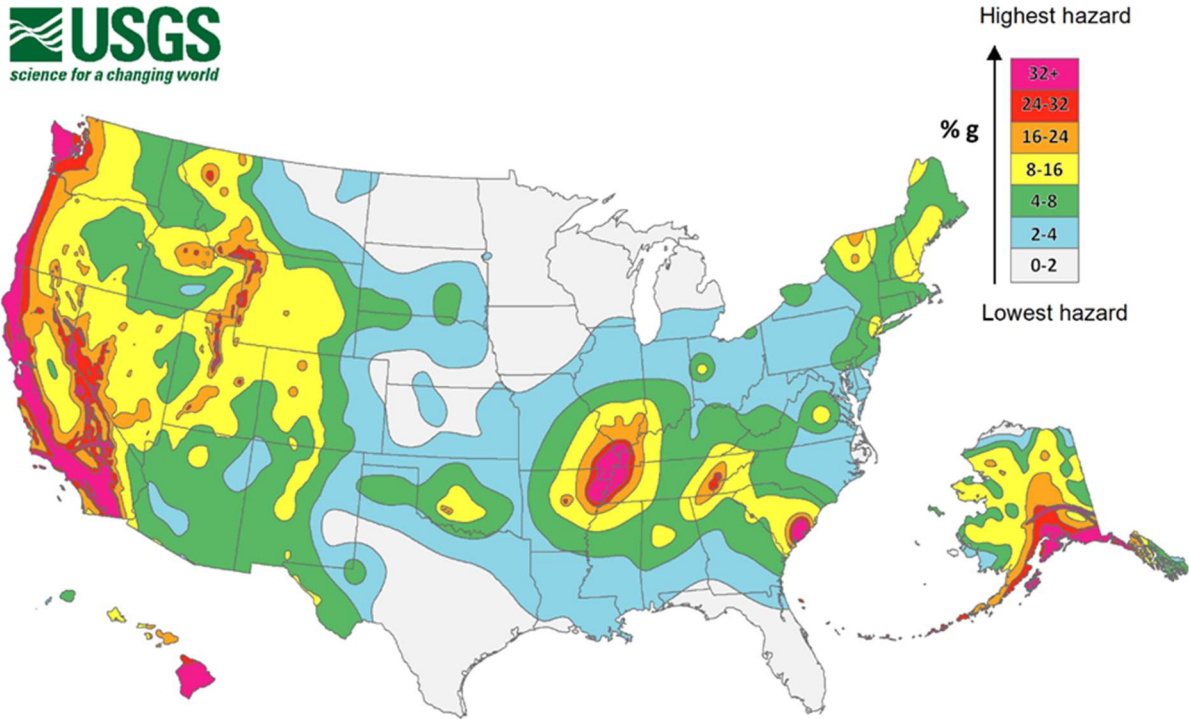


Table 6. Significant Earthquakes within San Bernardino County

Date	Area	Mag (M <sub>w</sub> )	Total damage/notes
7/29/2008	Chino Hills	5.4	No damage to JBWD
1/15/2014	La Habra	5.1	No damage to JBWD
3/29/2014	La Verne	4.4	No damage to JBWD
7/5/2014	Borrego Springs	5.4	No damage to JBWD
1/25/2018	Trabuco Canyon	4.0	No damage to JBWD
7/4/2019	Ridgecrest	6.4	No damage to JBWD
7/6/2019	Ridgecrest/Trona	7.1	No damage to JBWD
9/10/2019	Wildomar	4.0	No damage to JBWD

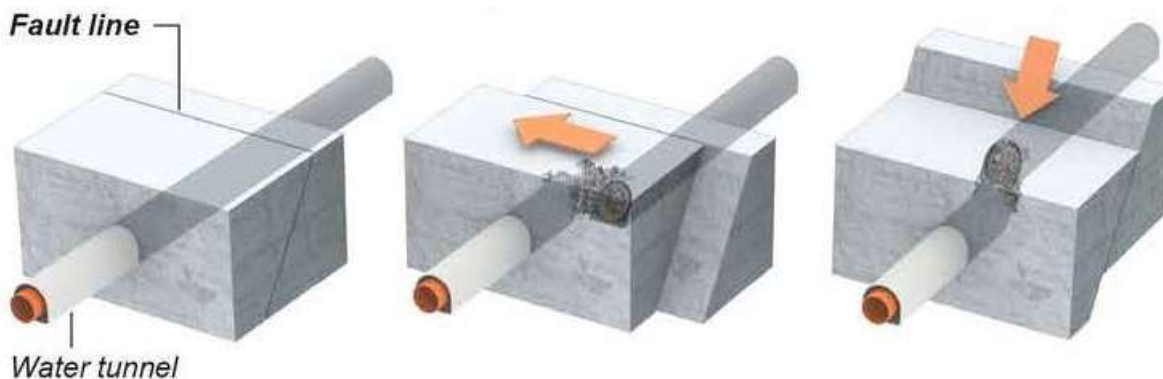
Within the 2018-2023 timeframe, there was a federal and/or state declaration declared for earthquakes within the JBWD service area. On July 8, 2019, The President issued an emergency declaration (EM-3415-CA) under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121-5207 (The Stafford Act), as follows:

“I have determined that the emergency conditions in certain areas of the State of California resulting from earthquakes beginning on July 4, 2019, and continuing, are of sufficient severity and magnitude to warrant an emergency 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 an emergency exists in the State of California...”

**Impact Statement:** A significant earthquake could have devastating impacts on JBWD 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 impeded if the roads needed to access them are damaged and impassable. 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.

There is no increase in impact from earthquakes that can be caused by climate change. Earthquakes can cause displacement, which would lead to changes in population patterns throughout their service area. JBWD 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 throughout the nation follow the standards set by the American Water Works Association and USEPA governing public water systems.

**Figure 7. How Ground Displacement Can Sever 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. JBWD could experience a loss of water from damaged systems.

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

**Building Facilities:** Shaking, ground displacement, and liquefaction have the potential to 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. If an event were to occur during working hours, failure may result in employee and customer deaths and injuries. Further, crews out in the field may also be injured or killed.

**Energy Storage and Power Failure:** An adequate energy supply is critical for JBWD 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, causing detriment to JBWD’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.

#### 4.3.2 CLIMATE CHANGE – INDUCED DROUGHT

**Probability: (75-100%)** Highly likely – Historical drought data for JBWD and its region indicate there have been at least 5 multi-year significant droughts within the last 47 years. This equates to a drought every 9.4 years on average or a 10.63 percent chance of a drought in any given year. Based on this data and given the multi-year length of droughts and future climate change effects, JBWD determined that future drought occurrence within their boundaries continues to be highly

likely. This section looks at all the hazards affecting the District within its boundaries that the Planning Team identified.

**Impact:** *Critical*

**Priority:** *Highly 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 the beginning and the end of a drought. 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 JBWD 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 have significant impacts on drought frequency and intensity, which will vary by region. Higher temperatures lead to increased evaporation rates, including more loss of moisture 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, a larger proportion 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 JBWD, 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. JBWD submitted its 2022 AWSDA and is in the process of submitting its 2023 AWSDA before the July 1<sup>st</sup> deadline. JBWD 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 JBWD 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 likely to increase as a result of climate change.

**Critical facilities** – All critical facility's exposure and vulnerability are likely to increase as a result of climate change.

**Vulnerability & Impacts:** Underserved and vulnerable populations they serve include people who are socioeconomically disadvantaged; 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 JBWD-owned critical facilities.



**Table 7. Drought Severity Replacement Costs**

<b>JBWD / Drought D0-D4 Severity</b>		<b>Replacement Value</b>
<b>D4 (Exceptional Drought)</b>		
<b>JBWD - All Critical Assets</b>		\$150 Million
<b>D3 (Extreme Drought)</b>		
<b>JBWD - All Critical Assets</b>		\$100 Million
<b>D2 (Severe Drought)</b>		
<b>JBWD - All Critical Assets</b>		\$50,000
<b>D1 (Moderate Drought)</b>		
<b>JBWD - All Critical Assets</b>		\$20,000
<b>D0 (Abnormally Dry)</b>		
<b>JBWD - All Critical Assets</b>		\$15,000

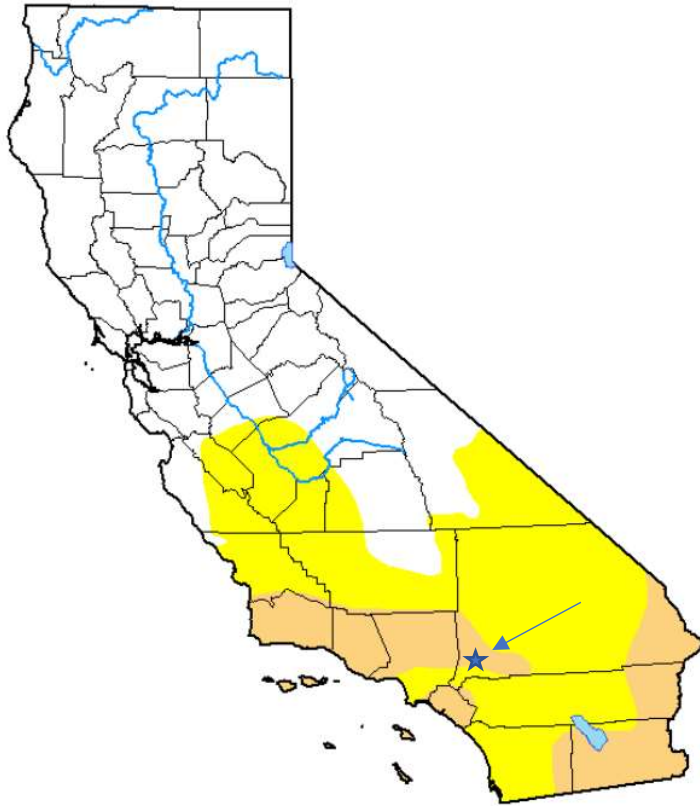
**U.S. Drought Monitor:** The U.S. Drought Monitor is designed to provide the general public, media, government officials, and others with an easily understandable overview of weekly drought conditions across a county throughout the United States. The U.S. Drought Monitor is unique because it assesses multiple numeric measures of drought, including the PDSI and three other indices, as well as the interpretations of experts 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 in the period between January 2018 and October 2023. Note the drastic difference between the two drought maps.

Figure 8. Drought Monitor January 2018

# U.S. Drought Monitor California

**January 2, 2018**  
(Released Thursday, Jan. 4, 2018)  
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	55.70	44.30	12.69	0.00	0.00	0.00
<b>Last Week</b> <i>12-28-2017</i>	55.70	44.30	12.69	0.00	0.00	0.00
<b>3 Months Ago</b> <i>10-05-2017</i>	77.88	22.12	8.24	0.00	0.00	0.00
<b>Start of Calendar Year</b> <i>01-04-2018</i>	55.70	44.30	12.69	0.00	0.00	0.00
<b>Start of Water Year</b> <i>09-28-2017</i>	77.88	22.12	8.24	0.00	0.00	0.00
<b>One Year Ago</b> <i>01-05-2017</i>	18.07	81.93	67.61	54.02	38.17	18.31

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>*

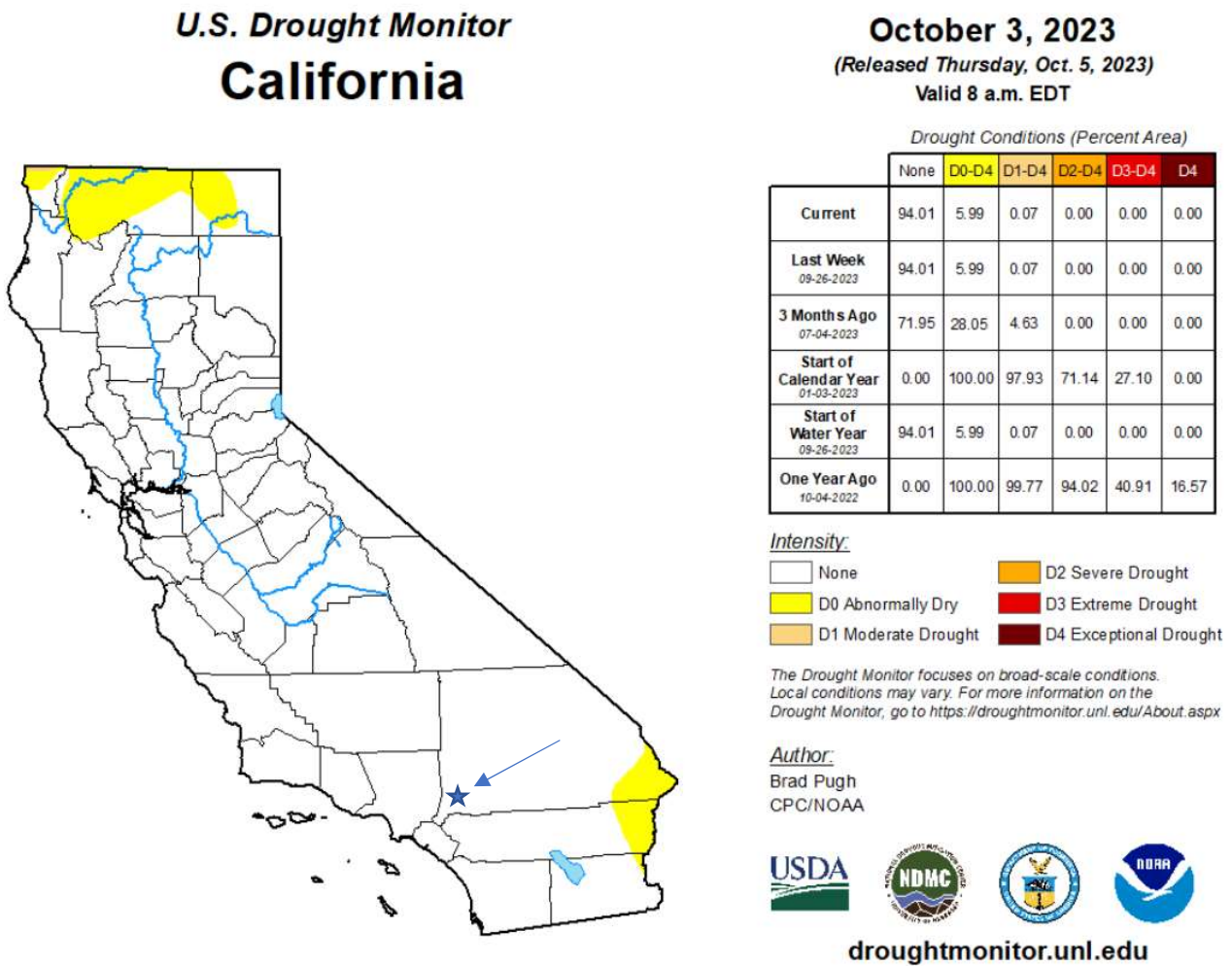
Author:

Eric Luebehusen  
U.S. Department of Agriculture



[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)

Figure 9. Drought Monitor October 2023



**Table 8. U.S. Drought Monitor**

<b>D0</b>	<b>Abnormally Dry</b>	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
<b>D1</b>	<b>Moderate Drought</b>	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
<b>D2</b>	<b>Severe Drought</b>	Crop or pasture losses likely; water shortages common; water restrictions imposed
<b>D3</b>	<b>Extreme Drought</b>	Major crop/pasture losses; widespread water shortages or restrictions
<b>D4</b>	<b>Exceptional Drought</b>	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

A drought is a regional event that is not confined to geographic or political boundaries; it can affect several areas at once. 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 that was 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. JBWD’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 is expected to result in reduced flows.

**Table 9 Drought History**

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 <i>Los Angeles Times</i> , “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 water years combined- were California’s driest such period on record.

The period between late 2011 and 2021 was 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 of those 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% of the state remained in the extreme or exceptional drought levels. Heavy rains in January 2017 were expected to have a significant benefit to the State's northern water reserves despite widespread power outages and erosional damage in the wake of the deluge.

The winter of 2022-23 turned out to be the wettest on record 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 2018-2024 timeframe, there are no federal and/or state declarations declared for California Climate Change–Induced Drought within the JBWD 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 also 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. The majority of drought impacts, however, are not structural but societal in nature. A drought's impact on society, and thus the JBWD's service area, results from the interplay between a natural event and the demand people place on water supply. JBWD is the entity in charge of supplying potable and non-potable water within its service area; therefore, it would be greatly impacted, both fiscally and politically, if it were unable to provide a reliable water supply due to drought conditions. Economically, water restrictions imposed during drought periods could result in lost revenue for JBWD. JBWD has no jurisdiction over land use, development and zoning, socially vulnerable populations, and/or land development within their service area. Water districts throughout the nation follow the standards set by the American Water Works Association and USEPA governing public water systems.

### 4.3.3 FLOOD

**Probability:** (50-75%) Likely – Historical flood data for JBWD and its region indicate there have been at least 2 significant floods within the last 5 years. This equates to an average flood every 2.5 years or a 40 percent chance of a flood in any given year. Based on this data, JBWD determined that future flood occurrence within their boundaries continues to be likely. This section looks at all the hazards affecting the District within its boundaries and identified by the Planning Team.

**Impact:** *Critical*

**Priority:** *Likely*

**General Definition:** An unusually heavy rain in a concentrated area, over a short or long period of time, which collects on the ground in low areas of the land. Flooding occurs when there are large amounts of rainfall in areas where the water runs off to lower elevations. Flooding is a very frequent, dangerous, and costly hazard. Globally, it accounts for 40 percent of all-natural disasters and results in an average of over 6,500 deaths annually. In the U.S., flooding results in an average of 86 deaths annually. Nearly 90 percent of all presidential disaster declarations result from natural events where flooding was a major component. On average, flooding causes more than \$2 billion in property damage each year in the United States. Floods cause utility damage and outages, infrastructure damage, structural damage to buildings, crop loss, decreased land values, and impeded travel.

Flooding is the most common environmental hazard due to the widespread geographical distribution of valleys and coastal areas and the population density in these areas. The severity of a flooding event is typically determined by a combination of several major factors, including stream and river basin topography and physiography, precipitation, and weather patterns, recent soil moisture conditions, and the degree of vegetative clearing and impervious surface. Flooding events can be brought on by severe (heavy) rain.

JBWD is not a member of NFIP. NFIP members are city and county governments that enforce building codes and permits and have authority over construction, planning, zoning, and land use, whereas JBWD does not have authority over any of these. JBWD has no properties that are repetitive loss structures.

**Probability:** The probability of increased flooding is high due to wildfires exacerbating flooding conditions. Wildfires can exacerbate flooding conditions when infiltration is affected and limited vegetation is in place. As wildfire probability increases, so will flooding; this is due to dry conditions and dried foliage which can be linked to climate change. While the recent drought conditions have resulted in a lack of rain events, the potential for future flooding still exists.

**Flash Flooding:** Flash floods occur within a few minutes or hours of heavy rainfall and can destroy buildings, uproot trees, and scour out new drainage channels. Heavy rains that produce flash floods can also trigger mudslides and landslides. Most flash flooding is caused by slow-moving thunderstorms or repeated thunderstorms in a local area or by heavy rains from hurricanes and

tropical storms. Although flash flooding often occurs in mountainous areas, it is also common in urban centers where much of the ground is covered by impervious surfaces.

**Climate Change Impacts:**

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

**Population**– Population vulnerability may increase as a result of climate change impacts on the flood hazard. Runoff patterns may change, resulting in flooding in areas where it has not previously occurred.

**Critical facilities** – All critical facility exposure and vulnerability may increase as a result of climate change impacts on the flood hazard.

**Vulnerability & Impact:** Underserved and vulnerable populations they serve include people who are socioeconomically disadvantaged; 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 the lack of 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 flooding conditions, vulnerable populations may not be able to find adequate, safe, potable water supplies for drinking, cooking, or hygiene needs. Flooding and dangers associated with the flood hazard can lead to vulnerable populations living in waterways, flood control channels, and adjacent to creeks and waterways, losing possessions and further displacement. It can further isolate these vulnerable populations and limit access to local, state, and federal resources.

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

**Table 10. Flood Zone Replacement Cost**

JBWD 100/500 Year Flood Zones		Replacement Value
<b>500-Year Flood Zone</b>		
<b>JBWD - All Critical Assets</b>		\$200 Million
<b>100- Year Flood Zone</b>		
<b>JBWD - All Critical Assets</b>		\$100 Million

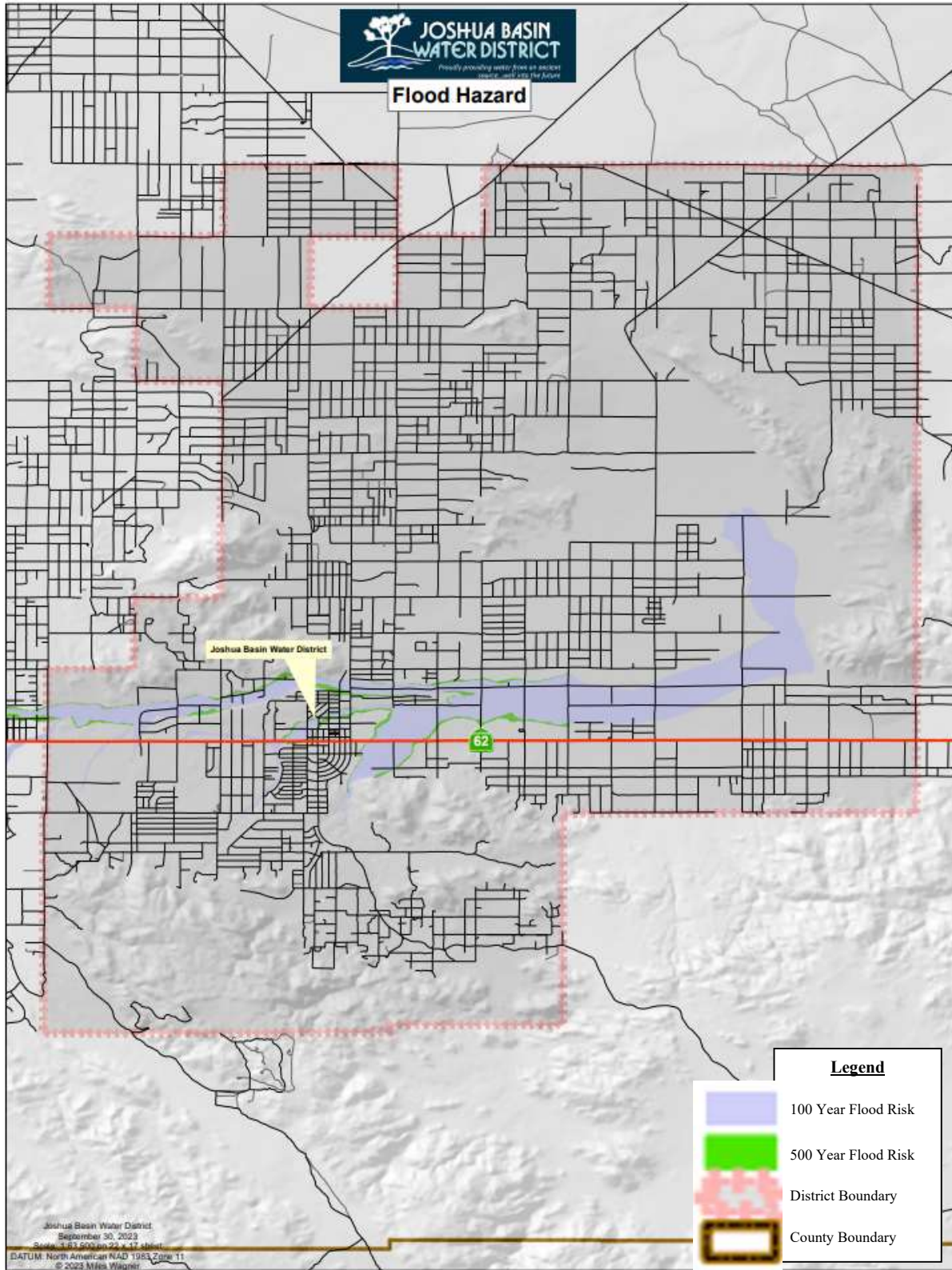


**Description:** Flooding is a frequent occurrence within the District's service area, particularly during severe rainstorms, which have been known to inundate the surrounding areas. This has not affected operations; 100-year and 500-year flood maps show potential inundation in the area. There has been no recorded damage caused by flooding within the service area that has affected JBWD infrastructure.

Within the 2018-2024 timeframe, there were four federal and/or state declarations declared for flood within the JBWD service area. Notice is hereby given that, in a letter dated January 9, 2023 (EM-3591-CA) later becoming (DR-4683) and March 16, 2023 (EM-3592-CA) later becoming (DR-4699), the President issued an Emergency Declaration and a Major Disaster Declaration under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121-5207 (the Stafford Act), as follows:

“I have determined that the emergency conditions in certain areas of the State of California resulting from severe winter storms, flooding, and mudslides beginning on January 8, 2023, and continuing are of sufficient severity and magnitude to warrant an emergency 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 an emergency exists in the State of California...”

Figure 10. Flood Zones within the JBWD Service Area.



### **Impact Statement:**

There is an increase in impact from flooding that can be caused by climate change. Climate change increases the overall flooding probability and can increase impact on the service area. Flooding can cause displacement, which would lead to changes in population patterns throughout their service area. JBWD has no jurisdiction over land use, development, and zoning, especially during a state and/or federal declared disaster.

- Flooding can result in a variety of impacts, such as death and injury, asset damage, inability to access facilities or assets, and road closures. Normal operations may be interrupted due to flooding. Some impacts from flooding include:
- Floodwater often contains bacteria and chemicals. Flooding of wells or reservoirs may result in water contamination, resulting in boil water advisories or reduced service.
- Floodwater can prevent normal access to assets and facilities. This presents a danger when motorists and pedestrians attempt to traverse floodwaters. Motor vehicles and pedestrians can get swept up in flood currents, increasing the risk of drowning. Even in shallow waters, fast-moving currents can carry individuals or vehicles into deeper waters, where pressure from flowing water can prevent drivers from escaping submerged vehicles. As little as six inches of floodwater can move a vehicle, and as little as two inches can move a person.
- Replenishment facilities, including percolation ponds, may be washed out by flooding, resulting in damage.
- Assets with electrical parts or motors may be damaged by flooding if these parts are submerged.
- Structures exposed to flooding, including critical facilities, can be severely damaged. Building contents can be lost, damaged, or destroyed, and structures themselves can be compromised by floodwaters. Pressure from floodwater, especially as seepage through the soil, can damage foundations.
- Buildings exposed to floodwaters may develop mold or wood rot.

#### **4.3.4 CYBER SECURITY**

**Probability:** (50-75%) Likely – Cyber data for JBWD and its region indicate there have been several attempted attacks on the District within the last 5 years. This equates to a cyber-attack every year on average or a 50 percent chance of a cyberattack in any given year. Based on this data, JBWD determined that the future occurrence of a cyberattack within their boundaries continues to be likely. This section looks at all the hazards affecting the District within its boundaries and were identified by the Planning Team.

**Impact:** *Critical*

**Priority:** *Likely*

**General Definition:** An attack via cyberspace, targeting an enterprise's use of cyberspace for the purpose of disrupting, disabling, destroying, or maliciously controlling a computing environment/infrastructure, destroying the integrity of the data, or stealing controlled information.

**Climate Change Impacts:**

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

- **Population**– Population exposure and vulnerability to cyber security are unlikely to increase as a result of climate change.
- **Critical facilities** – All critical facilities' exposure and vulnerability are likely to increase as a result of climate change.

**Vulnerability:** The vulnerable population is not affected by a cyber-attack on the water infrastructure, as a water district can manually operate the water system if needed.

**Description:** Outside sources gain access to electronic controls and processes to take over all electronic devices. The ability to control and gain access to critical records, information, and confidential data.

**Impact Statement:** There are several types of cyberattacks that can occur to the district, water, and wastewater control systems. Listed below are a few threats that the District is susceptible to:

- Malware
- Denial-of-Service (DoS) Attacks
- Phishing
- Spoofing
- Identity-Based Attacks
- Code Injection Attacks
- Supply Chain Attacks
- Insider Threats

#### 4.3.5 WILDFIRE

**Probability:** (25-50%) Somewhat Likely – Historical wildfire data for JBWD’s region (outside the service area) indicate there has been at least one significant wildfire within the last 5 years, however there has been no recorded wildfire data within the JBWD service area for the last 10 years. Based on this data, JBWD determined that future wildfire occurrence within their region continues to be somewhat likely. This section looks at all the hazards affecting the District within its boundaries and identified by the Planning Team.

**Impact:** *Limited*

**Priority:** *Somewhat Likely*

**General Definition:** A wildfire is any fire occurring in a wildland area (i.e., grassland, forest, brushland) except for fire under prescription or under 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 both 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 months. Southern California experiences Santa Ana winds that develop mostly 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 fires are driven by the high winds 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 are intensifying 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**– Population vulnerability may increase as a result of climate change impacts on the wildfire hazard. Evacuations and displacement may occur due to wildfire risks and the safety of the public.

**Critical facilities** – All critical facility exposure and vulnerability may increase as a result of climate change impacts on the wildfire hazard.

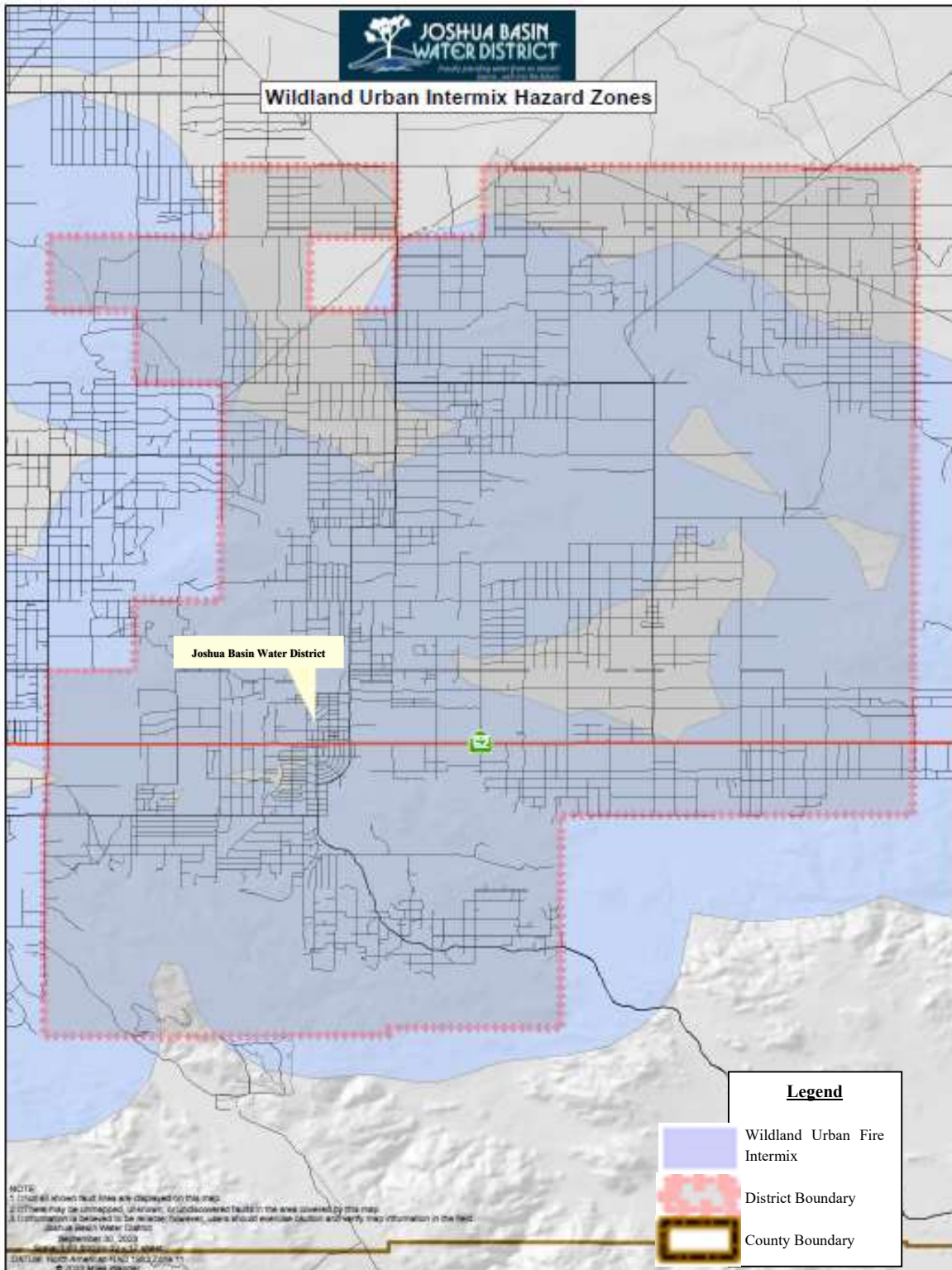
**Vulnerability & Impact:** Wildfire events can harm people throughout the JBWD service area but have a greater effect on the safety of people experiencing homelessness and those working outdoors. Populations that work outside or have respiratory illnesses may be impacted by severe wind events as they 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 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 months. Southern California has the Santa Anna winds that develop mostly 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 are also capable of blowing down power lines that are known to start fires in the mountains and hills. The fires are driven by the high winds, 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.

There are issues from wildfires that affect the District. 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 11. Wildfire Map with JBWD Boundaries





**Table 11. Wildfire History Near JBWD**

<b>Fire Name</b>	<b>Date</b>	<b>Acres Burned</b>
<b>Oak Fire</b>	May 31, 2022	35
<b>York Fire</b>	August 1, 2023	93,078

Within the 2019-2024 timeframe, there were no federal and/or state declarations declared for Wildfire within the JBWD service area.

**Impact Statement:** Wildfire events have the potential to cause a variety of impacts on JBWD 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 melted 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. JBWD will also need to supply water for fighting fires, which could impact the available supply.

In addition, wildfires also have the potential to result in indirect or cascading hazards to JBWD. Wildfires can cause power outages if utility lines are damaged, and burned areas are much more susceptible to landslides, as demonstrated by the 2018 mudflows in Montecito, CA.

A power outage has the potential to disrupt services provided in the service area. JBWD relies on an adequate energy source to power many of its assets, including booster stations, lift stations, reclamation plants, water treatment plants, and any other asset that requires an electrical component. JBWD has backup power supplies located on 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 of 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 JBWD 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, inclusive of 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 considered to be most at risk of wildfire. JBWD has no jurisdiction over land use, development and zoning, socially vulnerable populations, and/or land development within their service area. Water districts throughout the nation 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 the ability of JBWD 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 JBWD's capacity to bring them to fruition. A capability assessment highlights the positive mitigation activities already in place within JBWD and will detect the potential gaps.

### **5.2 EMERGENCY MANAGEMENT**

To help mitigate the potential impacts of disasters, JBWD joined CalWARN. The District has a mutual aid agreement with CalWARN that covers most water and wastewater agencies in California. As a government entity (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. CalWARN has 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 the impacts of hazards on the utility's infrastructure. CalWARN has access to utility leaders and 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.

The District currently employs thirty full-time and one part-time employee, and by joining CalWARN, the District has the potential to have hundreds of mutual aid workers at its disposal within hours of an emergency. The pressure zones, reservoirs, wells, and maintenance work done at Hi-Desert Medical Center Wastewater Treatment Plant facility are all operated by certified operators and maintained by a variety of certified technical disciplines. In addition, the District is in agreement with other water districts to support each other during an emergency by offering both labor and equipment to the incident.

The General Manager has over 7 years of experience in water. She has been with JBWD for 7 years. Throughout her career with the District, she 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 health and safety of the community. The ERP guides the process when an emergency occurs, including being a blueprint for the general operations during a disaster, distributing and managing responsibilities among authorities, and identifying liability.

JBWD Emergency Response Plan was last revised in August 2023 and details how the District will respond to various emergencies and disasters. JBWD 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, such as earthquakes or floods, result in downed power failures.
- Communications with critical users, media outreach, and public notification process.

JBWD 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. JBWD'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.

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

### 5.3 PLANNING AND REGULATORY CAPABILITY

Planning and regulatory capability is based on the implementation of plans, policies, and programs that demonstrate JBWD'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. Although conflicts can arise, these planning initiatives present significant opportunities to integrate hazard mitigation principles into JBWD's decision-making process.

The Urban Water Management and Planning Act requires water suppliers to estimate water demands and available water supplies. JBWD's updated Urban Water Management Plan (UWMP) was completed in September 2022. UWMPs are required to evaluate the adequacy of water supplies, including projections of 5, 10, and 20 years. These plans are also required to include impacts of climate change and water shortage contingency planning for dealing with shortages, including a catastrophic supply interruption.

The Water Supply Reliability Assessment is a section of the plan that aims to understand the ability to satisfy the water demand during different types of years (e.g., years with average rainfall versus drier years).

### **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 JBWD's water supply conditions and shortages resulting from catastrophic supply interruptions; JBWD WSCP was last updated September 2022. The WSCP also contains JBWD procedures for conducting an annual water supply and demand assessment, which is the written decision-making process for determining supply reliability each year, along with the data and methods used to evaluate reliability.

The WSCP is implemented through a series of ordinances of water use restriction in different stages. For instance, stage 1 requires a 10% water use restriction, and stage 5 requires greater than 50% water use restriction. The main method to reduce water use is by using water budget-based tiered rate structures and penalties for overuse.

UWMPs are intended to be integrated with other urban planning requirements and management plans. Some of these plans include Water Master Plans, Recycled Water Master Plans, Integrated Resource Plans, Integrated Regional Water Management Plans, Groundwater Management Plans, Emergency Response Plans, and others.

## **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 Urban Water Master Plan – Updated every 10 years
- Water Shortage Contingency Plan (WSCP)– Updated every 5 years
- San Bernardino County Fire Master Plan- Updated annually
- San Bernardino County Flood Master Plan- Updated annually
- USEPA PSPS SOP for Public Water Systems - Updated every 5 years

## 5.5 MITIGATION PROGRAMS

JBWD 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.

The District offers incentives to improve water use efficiency. These incentives include a high-efficiency hose nozzle, low-flow shower heads, conservation educational classes, and water surveys for leak detection. To promote voluntary conservation, the District has initiated a public awareness and education plan consisting of the following:

- A citizens advisory committee is used to inform and educate constituents about water issues, including water supply conditions and water use efficiency.
- The District stores disaster supply storage sheds at their corporate yard and District office for employees during an emergency. The supply shed is complete with cots, chairs, food bars, MREs, first aid kits, light sticks, batteries, blankets, personal sanitation kits, water, flashlights, etc.
- The District's Human Resources Department develops and maintains safety manuals and emergency response manuals that are specific to the facility where each department works.
- The District's Business Emergency Plan is updated annually for both local and county fire hazardous materials departments.
- The District plans on starting mitigation outreach via a citizens advisory committee and using the Constant Contact platform.

## 5.6 FISCAL RESOURCES

The ability of JBWD 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 JBWD and state and federal funding sources. JBWD has made fiscal commitments to the mitigation of hazards through its Capital Improvement Replacement Plan (CIRP).

The following is a summary of the District's fiscal capabilities. There are a number of governmental funds and revenue-raising activities that 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 from industrial users
- 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, Building Resilient Infrastructure Communities (BRIC), 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 JBWD'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 JBWD will consider in the Mitigation Strategy.

1. **Coordinate** with the San Bernardino County Emergency Management to achieve interoperability of Web EOC software and representations in appropriate EOCs.
2. **Provide** necessary staffing and software for ongoing maintenance of asset management program data.
3. **Add funding** for hazard mitigation actions to the District's Capital Improvement Replacement Plan planning efforts.
4. **Incorporate** projects from the Capital Improvement Replacement Plan into the mitigation strategy (and vice versa).
5. **Expand** Public outreach and education on emergency management. This allows JBWD 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.
6. **Broaden** staff training: JBWD 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 educating grades K-12 in the local schools and on the JBWD website.

## **SECTION 6. MITIGATION STRATEGIES**

### **6.1 OVERVIEW**

JBWD 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, climate change–induced drought, flooding, wildfire and cyber security.

### **6.2 MITIGATION GOALS, OBJECTIVES, AND PROJECTS**

The process of identifying goals began with a review and validation of the FEMA Hazard Maps for JBWD and surrounding cities in San Bernardino County. 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.
- JBWD 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 JBWD.
- 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 four high-profile hazards for JBWD are earthquakes, climate change–induced drought, flooding, and cyber security. While other hazards were profiled in previous sections, JBWD’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 2018 LHMP.

Earthquake Mitigation (EM) = Seismic shut-off valves, Flex couplings at Reservoir, reservoir venting, bolt down infrastructure. Flooding Mitigation (FM) = Block Walls and or diversion walls. Security (S) = Updated Security Camera, updated SCADA systems, and Employee card ID readers. Generators (G) = Generators and automatic switching equipment.

**Table 12. Mitigation Actions from 2018 LHMP**

<b>Title/Mitigation Action</b>	<b>Status</b>
<b>District Office/Shop – Security Camera Upgrade</b>	Completed 2019
<b>Shop/warehouse – Security Camera Upgrade</b>	Completed 2019
<b>SCADA Server – Security Cameras</b>	Completed 2019
<b>Well 14 – Complete rehab</b>	Completed 2022
<b>D-1-1 Booster Station – Rehab</b>	Completed 2024
<b>Facility F2 – EM, G, S</b>	EM/S completed 2021 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Facility I-1 – EM, G</b>	EM completed 2021 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Facility D-3 – EM, G, S</b>	EM/S completed 2021 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Facility G-1 – EM, G</b>	EM completed 2021 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Facility J-1 EM, G</b>	EM completed 2021 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Booster Station H-1 Booster F-2, EM</b>	EM - no longer relevant and not included in the 2024 mitigation strategies
<b>Booster Station D-2 Booster at C-1, EM</b>	EM - no longer relevant and not included in the 2024 mitigation strategies
<b>Booster Station E-1 Booster at C-1, EM, G</b>	EM - no longer relevant and not included in the 2024 mitigation strategies G- no longer included in the 2024 mitigation strategies – no available grants for funding.



<b>Well-16 – EM, S, G</b>	EM - included in the 2024 mitigation strategies S completed 2022 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Well-17 - EM, S, G</b>	EM - included in the 2024 mitigation strategies S completed 2022 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Well-10 - EM, S, G</b>	EM - included in the 2024 mitigation strategies S completed 2023 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Well-14 - EM, S, G</b>	EM - included in the 2024 mitigation strategies S completed 2022 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Well-15 - EM, S, G</b>	EM - included in the 2024 mitigation strategies S completed 2023 G- no longer included in the 2024 mitigation strategies – no available grants for funding.
<b>Reservoir D-2 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir D-3 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir C-3 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir F-2 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir H-1 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023

<b>Reservoir J-1 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir E-1 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir G-1 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir I-1 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir B-1 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir A-1 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir C-1 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir D-I-2 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir E-2 – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023
<b>Reservoir C-2-B – EM, FM, S</b>	EM/FM - included in the 2024 mitigation strategies S completed 2023

### 6.3 EARTHQUAKE

**Goal:** To protect life and property in Joshua Basin 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 department 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 JBWD. As JBWD is a community facing economic challenges, 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 in order to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- Bolt down water reservoir facilities. Director of Operations or General Manager. (5 Years) \$1.5 million. HMGP, BRIC, and CIRP. High Priority.
- Seismic shut-off valves on all reservoirs. Director of Operations or General Manager. (5 Years) \$1.5 million. HMGP, BRIC, and CIRP. High Priority.
- Flex couplings on all wells and reservoir pipelines. Director of Operations or General Manager. (5 Years) \$1.8 million. HMGP, BRIC, and CIRP. High Priority.
- Protect critical facilities and infrastructures. Tying down equipment, strengthening buildings, training on following the emergency response plan, and opening an EOC. \$1.5 Million. Director of Operations (5 Years). HMGP, BRIC, and CIRP. High Priority.
- Conduct annual employee training for responding to an earthquake. This includes tabletop exercises, boots-on-the-ground exercises, and SIMS/NIMS training. \$30,000 (*Annually*) Safety and HR Department. CIRP. High Priority.

#### 6.4 CLIMATE CHANGE – INDUCED DROUGHT

**Goal:** To protect life and property in Joshua Basin 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 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 JBWD. As JBWD is a community facing economic challenges, 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 in order to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- Improve operational efficiency system leaks and increase water pumping capabilities. Enlarge intertie with Hi-Desert Water District. Improving pipelines, collection systems, and leak surveys. Looking for water loss in the system, etc. \$2 Million (5 Years) Director of Operations HMGP, BRIC, CIRP. High Priority.

## 6.5 FLOOD

**Goal:** To protect life and property in Joshua Basin Water District in the event of flooding.

JBWD is **not** a participant in the National Flood Insurance Program (NFIP).

**Description:** *The goal is to avoid injury, loss of life, and damage to property.* A localized flood of great volume and short duration is typically caused by unusually heavy rain in a semiarid area. Floods 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 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 JBWD. As JBWD is a community facing economic challenges, 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 in order to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- Improve existing facilities and construct new facilities to mitigate flooding (5 Years) \$5 Million. Director of Operations. BRIC, HMGP.
- Install stormwater drainage. Assessment of access roadways and points leading to facilities and install bridges crossing dry creek beds to access wells and reservoirs when flooded. (5 years). \$4.5 Million. BRIC, FMA, HMGP, CIRP. Director of Operations.
- Block Walls and or diversion walls at reservoirs to divert flood waters. (5 Years) \$18 Million. HMGP, BRIC, CIRP, FMA. Director of Operations.

## 6.6 WILDFIRE

**Goal:** To protect life and property in Joshua Basin Water District in the event of a wildfire.

**Description:** *The goal is to avoid injury, loss of life, and damage to property and to maintain water flow for firefighting efforts.* JBWD 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 the hills into the valley.

### **Mitigation Projects:**

Below is the priority of the project department 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 JBWD. As JBWD is a community facing economic challenges, 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 in order to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- Remove brush and trees from around facilities. \$30,000 (Annual). High Priority. Director of Operations. CIRP.
- Recoat inside reservoirs with fire retardant coating. \$1.5 Million (5 years). Medium Priority. Director of Operations. HMGP and BRIC.
- Remove old wood electrical panels and install them into block buildings, increasing fire resiliency and security. \$2.5 Million. (5 Years). High Priority. Director of Operations. HMGP, CIRP, and BRIC.

## 6.7 CYBER SECURITY

**Goal:** To protect life and property in Joshua Basin Water District in the event of a cyber security attack.

**Description:** *The goal is to avoid injury, loss of life, and damage to property. A cyber-attack can be in many forms, such as malware, phishing, and insider threats. It is up to the District to train and protect from external or internal infiltration. As an added security measure, the District will not share its cyber security planning within this LHMP.*

### **Mitigation Projects:**

Below is the priority of the project department 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 JBWD. As JBWD is a community facing economic challenges, 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 in order to finance capital and mitigation initiatives. The identified projects and current cost estimates include:

- SCADA Standards Revision. Update and modernize the current SCADA system. \$25,000 (2 Years). High Priority. Director of Operations. HMGP and BRIC.
- District-wide Video Surveillance Improvement. Update, install, and modernize video cameras and recording devices. \$1 million. High Priority. (5 Years). IT Department. HMGP and BRIC.

## 6.8 MITIGATION PRIORITIES

During the development of the risk assessment for JBWD, the Planning Team proposed and discussed alternative mitigation goals, objectives, and specific mitigation measures that JBWD should undertake to reduce the risk from the five high-risk hazards facing the District. Priorities from the 2018 LHMP have not changed for the 2024 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, it is clear that 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 JBWD services and infrastructure, those mitigation measures that improve disaster resistance, readiness, or recovery capacity are generally given higher priority.

Earthquakes, climate change–induced drought, flooding, and cyber security 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 amount of time. JBWD is currently operating within its annual budget. JBWD revenues and capital improvement replacement projects have remained a priority. JBWD staff 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 JBWD staff will also actively explore opportunities to secure Hazard Mitigation Grants annually in order 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 with FEMA, the formula is all in electronic form but resembles the formula below.

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

### **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 replacement projects that it undertakes. The previous 2018 LHMP was incorporated in the CIRP, and any other relevant planning mechanisms, including the Urban Water Management Plan that incorporates LHMP mitigation projects.

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

## **SECTION 7. PLAN MAINTENANCE**

### **7.1 MONITORING, EVALUATING, AND UPDATING THE PLAN**

The General Manager or his/her assignee 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 done 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 in the spring of each year and whenever there are new infrastructure updates within JBWD. The General Manager or his/her assignee will ensure the LHMP is reviewed annually, and any items that have been mitigated will be recorded within the plan. At that time, staff and the elected Board of Directors will review funding and capital improvement replacement projects in the next fiscal year's budget. Annually, the General Manager or his/her assignee will review funding and determine the projects to be included in the next fiscal year's CIRP budget. The General Manager or his/her assignee 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 or his/her assignee leads a full review of the LHMP at a three-and-a-half-year interval like the initial LHMP. At this time, 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 will be addressed by the Planning Team headed by the Operations Department that will include the General Manager or his/her assignee.

The consumers within Joshua Basin Water District and the District's personnel 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. In the 2018 LHMP, the plan was incorporated into planning documents for updates on water mains.

### **7.2 IMPLEMENTATION THROUGH EXISTING PROGRAMS**

Once the State of California OES and FEMA approve the LHMP, JBWD 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 flood 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. JBWD will submit a Notice of Intent to the State of California to help facilitate opportunities in obtaining FEMA and State funding to mitigate hazards within the water system. The General Manager or his/her assignee will be responsible for implementing the LHMP and working toward the LHMP-recommended goals and objectives that are met. The General Manager or his/her assignee will be responsible for placing the LHMP on the District's website and incorporating the LHMP into the annual budget planning meetings. The General Manager or



his/her assignee will verify that the LHMP is updated and rewritten over a 5-year cycle. JBWD 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 on the JBWD's Website with contact information. The General Manager or his/her assignee 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 JBWD, the LHMP will be updated to include new facilities and new hazards, if warranted. When the LHMP is rewritten and updated, the public will be utilized to review and coincide with the document's changes. It is the General Manager or his/her assignee's responsibility to ensure the LHMP is updated throughout the year and every 5 years.

The plan is reviewed annually. JBWD Operations Department and General Manager will conduct outreach with the nonprofit organizations, including community-based organizations, to represent the community's input into the updates. JBWD can also learn how priorities in the communities are changing or 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

**Table 13. Meeting Matrix**

<b>Meeting Matrix/ Attendees</b>	<b>10/12/23 Introduction meeting (In-Person)</b>	<b>11/27/23 Working Session (In-Person)</b>	<b>12/19/23 Working Session (In-Person)</b>	<b>1/9/23 Citizens Advisory Committee Meeting Public Review Session (In-Person)</b>	<b>1/15/24 Final Planning Meeting (Zoom)</b>
<b>Sarah Johnson</b>	X	X	X	X	X
<b>Lisa Thompson</b>	X	X	X	X	X
<b>Jeremiah Nazario</b>	X	X	X	X	X
<b>Scott Carpenter</b>	X	X	X		X
<b>David Shook</b>	X	X	X	X	X
<b>Gary Sturdivan</b>	X	X	X	X	X

**Joshua Basin Water District**  
**Local Hazard Mitigation Plan**  
**October 12, 2023**

1. Introduction.
2. Why are we here?
3. What is a Local Hazard Mitigation Plan
4. CalOES and FEMA approval
5. What must be included in the LHMP
6. FEMA LHMP review tool
7. Next meeting date and time

**Joshua Basin Water District**  
**Local Hazard Mitigation Plan**  
**November 27, 2023**

1. Introduction.
2. Why are we here?
3. Sections 1-3 of the LHMP Draft were sent to all team members; do you have any questions?
4. Sections 4 and 5 are under development
5. What has changed, and what is underdevelopment? Mitigation items that are complete, new mitigation items.
6. What natural Hazards have occurred in the last 5 years, and what damage have these incidents caused damage to the water system
7. Next meeting date and time

**Joshua Basin Water District**  
**Local Hazard Mitigation Plan**  
**December 19, 2023**

1. Introduction.
2. Why are we here?
3. Sections 4 and 5 of the LHMP Draft were sent to all team members; do you have any questions?
4. Any concerns or comments on sections 1-5
5. Go over HASUS maps with the team; maps were emailed to the team.
6. Sections 6 and 7 are under development
7. What has changed, and what is underdevelopment? Mitigation items that are complete, new mitigation items.
8. Does anyone have any new items to mitigate
9. Next meeting date and time

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**Joshua Basin Water District**  
**Local Hazard Mitigation Plan**  
**January 9, 2024**

1. Introduction of the JBWD Public Advisory Committee.
2. The draft was posted on the District Website, and SEMC received public comments.  
  
None of the five public comments related to natural hazards that affect the area of concern. Sarah and SEMC addressed the comments and reported back to the sender.
3. Discussion with the Citizens Advisory Committee for approval to send to the Board of Directors for approval.

# APPENDIX B

## PUBLIC OUTREACH



**Figure 12. JBWD Public Outreach Email through Constant Contact**



Dear Joshua Basin Water District Customers,

We'd like to invite you to review our updated draft Local Hazard Mitigation Plan and we are soliciting your input and comments.

Comments must be received by February 7, 2024.

Please submit any comments to: [customerservice@jbwd.com](mailto:customerservice@jbwd.com)

Subject Line: Hazard Mitigation Planning Feedback

**2024 Hazard Mitigation Plan**



**Click-Through Distribution**

When a contact clicks a link in your email, we'll show you the stats here.

Link	Unique Clicks	Distribution
<a href="https://www.jbwd.com/index.asp?SEC=5A46B712-A758-4A61-BA4A-319B95F3926D">https://www.jbwd.com/index.asp?SEC=5A46B712-A758-4A61-BA4A-319B95F3926D</a>	96	100%
<b>Total Click-throughs</b>	<b>96</b>	<b>100%</b>

**Send History**

History of this email being sent including how many people it was sent to.

Date	Sent Count	Status
Thu, Jan 25, 2024 5:23 pm PST	3076	Your email has been successfully sent.

Template Name: CPE-PT17831

APPENDIX C  
PUBLIC COMMENTS

## 2024 Local Hazard Mitigation Plan Public Comments

Select public comments were not pertinent to updating the JBWD LHMP, the ones that were adjudicated into the LHMP renewal are marked **COMPLETE**. The page numbers represent the public comment draft that was available during the public feedback session.

p. 14 Planning Team: Include credentials.

p. 16 Public Involvement Outreach (and p. 61 Continued Public Involvement): Why was the Tier Drop Newsletter nor the Hi-Desert Star not utilized for informing constituents, and will it be used for future public notifications? Future emails sent to customers seeking public input should include an introduction to what a Hazard Mitigation Plan is as the general public likely is unfamiliar.

p.20 Hazard Identification: Include Decreased Water Quality as a hazard to mitigate.

p. 52 Fiscal Resources: State and Federal grants bullet should also include local/County grants.

p. 55 Table 12: also include any mitigation projects from the 2018 LHMP that have not been completed and what their estimated completion dates are. Will incomplete projects be included in the updated 2024 Plan? **COMPLETE**

p. 56 Drought Mitigation Projects: consider including public education campaign for Water Conservation; providing rebates for water efficient appliances such as low flow toilets and washing machines; increase groundwater replenishment through various methods such as retention and detention ponds, bioswales, groundwater injection, etc.; collaborate with agencies that permit development to require Standard Urban Stormwater Management Plans (SUSMPs) to minimize the increase of impervious surfaces in the Water District's boundary; Collaborate with local agencies, Caltrans, and County Stormwater Management to set goals to increase water replenishment via similar methods as described above.

p. 56 Flood Mitigation Measures: After any moderate rain event there are numerous areas within the District's boundary that flood making it clear there is a need for additional stormwater management to reduce flows and capture stormwater. Similar to flooding, mitigation measures such as retention and detention ponds, and bioswales and managing the increase of impervious surfaces should be included. However, for success these cannot be implemented on the District's property alone and there will have to be efforts made from the local Planning Departments, Caltrans, and County Stormwater Management. Collaborate with these agencies to set goals to reduce and flow and quantity of stormwater.

General Comments: Climate change is an integral part of this Hazard Mitigation Plan as every risk assesses the impact from it and therefore it is crucial the District address climate change proactively. Mitigation measures include requiring redundancy and resilience be incorporated into all future construction projects; award additional points in RFQ/RFPs for organizations that have a sustainable business plan and an Envision Sustainability Professional (Envision is a sustainable infrastructure rating system similar to LEED); the District adopting a Sustainability

Business Plan; registering the District as an Institute of Sustainable Infrastructure Organization (free for Public Agencies); having a minimum of one internal staff member become an Envision Sustainability Professional; require all future construction projects to utilize the free checklist of LEED for vertical construction and Envision for horizontal construction.