DIABLO WATER DISTRICT

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AGENDA

The Special Meeting of the Board of Directors of Diablo Water District will be held on September 18, 2024 at 3:00 pm at the District's office, 87 Carol Lane, Oakley, California. This meeting is being conducted in person and via webinar. Members of the public and District staff may attend the meeting via conference call / web using the credentials below. Members of the public will continue to have the opportunity to provide public input via the webinar or phone features.

Dial in Number: 1-949-346-1487

Conference ID: 361 966 009#

Or

Web Option: www.diablowater.org/webmeetings

Check your browsers' functionality or download the Microsoft Teams App prior to the meeting.

The District's agendas and supporting documents are available on the District's website: www.diablowater.org, or by calling Kait Knight at (925) 625-6587. A fee may be charged for copies.

If you have a special accommodation needs to attend the meeting, please provide at least two (2) working days' notice prior to the meeting by calling Kait Knight at (925) 625-6587.

1. **Call to Order, Roll Call, and Pledge of Allegiance.**

2. **Public Input.**
   Anyone present may address the Board of Directors on any subject within the jurisdiction of Diablo Water District. If the subject item is on this Agenda, please hold public comment until the appropriate item. **All virtual attendees will remain on mute until called upon to address the Board.**

Action Items

3. Adoption of the 2024 Contra Costa County Hazard Mitigation Plan – Volume II: Diablo Water District Annex.

Staff Recommendation: Adopt resolution number 2024-12 approving the adoption of the District's Annex of the 2024 Contra Costa County Local Hazard Mitigation Plan.

4. Next Meetings of the Board of Directors.

- September 25, 2024 Regular Meeting – 6:30 pm
- October 23, 2024 Regular Meeting – 6:30 pm
- November 13, 2024 Special Meeting – 6:30 pm
- ~~November 27, 2024 Regular Meeting – 6:30 pm- Cancelled~~
- December 11, 2024 Special Meeting – 6:30 pm
- ~~December 25, 2024 Regular Meeting – 6:30 pm- Cancelled~~

5. Adjournment.

Posted this 16th day of September 2024.

Dan Muelrath, General Manager

DIABLO WATER DISTRICT
September 18, 2024 Board Meeting
Item Number 3

TO: Each Director

FROM: Dan Muelrath, General Manager

SUBJECT: Adoption of the 2024 Contra Costa County Hazard Mitigation Plan – Volume II: Diablo Water District Annex.

Staff has been working with Contra Costa County and various other local jurisdictions to prepare an update to the 2018 Contra Costa County Local Hazard Mitigation Plan (LHMP). The purpose of the plan is to establish a partnership, pool resources and create a uniform hazard mitigation strategy that can be consistently applied to the County and ensure eligibility for specified grant funding sources. The previous plan was adopted by the District in 2019 and is required by law to be updated periodically.

Currently, the LHMP is under review by the California Office of Emergency Services (CalOES) and the Federal Emergency Management Agency (FEMA). We have received, addressed, and returned their first-round comments. Attached is the District's updated plan along with Resolution Number 2024 – 12, adopting the District's portion of the LHMP.

Last fall, the District was able to get a one-year extension for compliance due to the County being behind schedule (LHMPs were due in 2023). With this in mind, Staff would normally have provided a final draft of the plan annex for review. However, FEMA has indicated that if we do not adopt this draft annex (subject to final changes) prior to September 26, 2024, the District's Seismic Retrofit Project Grant for R2 reservoir will be denied and the District would need to start over.

RECOMMENDATION:

Adopt resolution number 2024-12 approving the adoption of the District's Annex of the 2024 Contra Costa County Local Hazard Mitigation Plan.

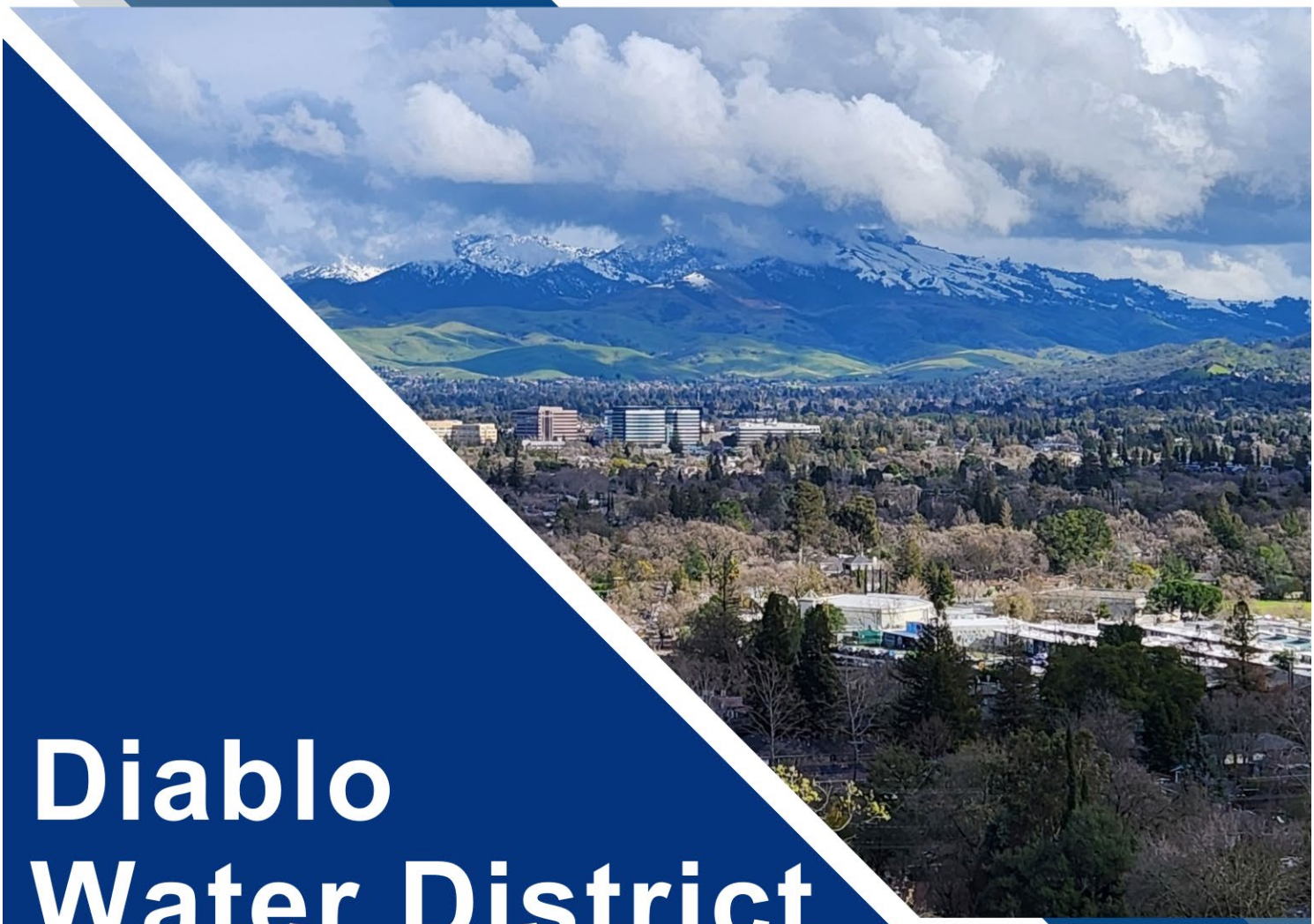
Dan Muelrath
Dan Muelrath
General Manager

Attached: DWD Annex
Resolution Number 2024 – 12

Quality Integrity

2024 Hazard Mitigation Plan

Contra Costa County, California



Diablo Water District Annex

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1. INTRODUCTION

This Annex details the hazard mitigation elements specific to Diablo Water District, a participating jurisdiction to the 2024 Contra Costa County Hazard Mitigation Plan update. This Annex is not intended to be a standalone document but supplements the information contained in **Volume 1 (Planning Area-wide Elements)**. Therefore, all sections of **Volume 1 (Planning Area-wide Elements)** including the planning process, mitigation goals and objectives, hazard identification and risk assessment, mitigation strategy, and plan maintenance apply to and were met by the District. This Annex provides additional information specific to the District, with a focus on providing additional details on the hazard risk assessment and mitigation strategy (i.e., mitigation actions) for this community.

2. LOCAL PLANNING TEAM

The Diablo Water District Local Planning Team was comprised of the members listed on **Table 1**.

Table 1. Diablo Water District Local Planning Team Members

Name	Title	Department
Wayne Weaver	Manager of Maintenance and Construction	Diablo Water District
Atanacio Mendoza	Manager of Water Operations	Diablo Water District
Christine Belleci	Forward Planning Manager	Diablo Water District
Luis Romero	Water Distribution System Lead	Diablo Water District
Sandra Leyba	Forward Planning Analyst	Diablo Water District

3. JURISDICTION PROFILE

The Diablo Water District (DWD) is a self-governing local public agency that services an area consisting of the City of Oakley, and unincorporated areas of Hotchkiss Tract, East Cypress Corridor Specific Plan Area, and Summer Lakes development, the Town of Knightsen, and certain communities on Bethel Island including Delta Coves. The District is bounded by the San Joaquin River to the north, the City of Antioch to the west, the City of Brentwood to the south, and unincorporated area to the east.

The District serves approximately 29 square miles (18,650 acres). The distribution pipeline network grid is approximately 180 miles consisting of 10-inch to 24-inch mains and secondary feeder pipelines of two (2) inch to eight (8) inch mains. The pipeline grid is fed by 24-inch and 30-inch mains from the Randall-Bold Water Treatment Plant (RBWTP) and DWD's Blending Facility.

DWD primarily supplies treated water for domestic use and some non-potable water for park and landscape irrigation. The District's sources of water supply are untreated water from the Central Valley Project, purchased from the Contra Costa Water District (CCWD), and groundwater extracted from the East Contra Costa Subbasin. The surface water is conveyed through the Contra Costa Canal and treated RBWTP in Oakley. The RBWTP is jointly owned by DWD and CCWD and managed and operated by CCWD.[1]

[1] Contra Costa Special Districts Association. (n.d.). Diablo Water District. Retrieved from https://contracostasda.specialdistrict.org/diablo-water-district.

3.1. Population

DWD provides services to a total population of approximately 45,555.

3.1.1. Underserved Population

The 2023 California State Hazard Mitigation Plan identifies the Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) as the most appropriate and authoritative dataset to identify areas where efforts can be prioritized to ensure equitable outcomes from mitigation planning and actions.

CDC's SVI combines 16 social factors, within four (4) themes (i.e., socioeconomic status, household characteristics, racial and ethnic minority status, and housing type and transportation), to identify areas of social vulnerability. **Table 2** outlines the SVI information for the DWD planning area boundary.

Note: *ArcGIS mapping analysis was performed utilizing Census Tract data by overlaying Census Tracts with the DWD planning area boundary. The information outlined in this section includes data from the Census Tracts that intersect the jurisdiction.*

Table 2. Social Vulnerability Index (2020)

Theme	Social Factors	Percent
Socioeconomic Status	People below 150% poverty estimate	17.5%
	Unemployed *(Civilian 16 years old and older)*	3.0%
	Housing Cost Burden	8.6%
	No High School Diploma	8.4%
	No Health Insurance	3.0%
Household Characteristics	65 years old and older	11.6%
	17 years and younger	31.9%
	Civilian with a Disability	14.8%
	Single-Parent Household	1.8%
	English Language Proficiency	4.3%
Racial and Ethnic Minority Status	• Hispanic or Latino (of any race) • Black or African American • Asian • American Indian or Alaska Native • Native Hawaiian or Pacific Islander • Two or More Races • Other Races	61.8%
Housing Type and Transportation	Multi-Unit Structures	1.5%
	Mobile Homes	1.9%
	Crowding	1.5%
	No Vehicle	1.4%
	Group Quarters	0.5%

3.2. Brief History

DWD was created in May 1953, under the County Water District Law of California, as the Oakley Water District.

3.3. Governing Body Format

A five (5) member elected Board of Directors governs DWD. The Board assumes responsibility for the adoption of this Plan and the General Manager will oversee its implementation. As of February 2024, DWD serves approximately 13,800 water connections, mainly single family. DWD has a staff of 25 full-time employees. Funding comes primarily through water rates and developer connection fees.

4. DEVELOPMENT TRENDS

Historically, land use within DWD's jurisdiction has been predominately rural and agricultural, but recently, the area has become increasingly suburban, and the role of agriculture has diminished. Today, approximately 35% of land within DWD Sphere of Influence is agricultural production or is undeveloped open space, primarily in the eastern part of the jurisdiction. However, those lands are slowly developing.

Since 2006, growth within the jurisdiction has generally slowed compared to past projections. The future land uses in the eastern portion of the jurisdiction have become better defined for certain developments. Recent development in the area includes large subdivisions in eastern Oakley and growth along the perimeter of Bethel Island. In addition, the Delta Coves subdivision is currently under construction on Bethel Island and a large subdivision started construction in eastern Oakley in 2024.

An ultimate buildout of DWD jurisdiction is assumed to occur by 2040. The buildout population is estimated at approximately 64,000.[2]

4.1. Changes in Priority

DWD has prioritized protecting the District's distribution system against earthquakes and droughts. The District has also enhanced planning efforts for future droughts and assessed the use of recycled water as a potential mitigation effort. Additionally, mitigation actions from the previous Plan were updated, and a more concerted effort on achieving equitable outcomes for all communities, including underserved communities and socially vulnerable populations, has been implemented.

5. CAPABILITY ASSESSMENT

Federal regulations require hazard mitigation plans to identify goals for reducing long-term vulnerabilities to the identified hazards in the planning area (Section 201.6(c)(3)(i)). A critical step in the development of specific hazard mitigation actions and projects is assessing existing authorities, policies, programs, and resources and capabilities to use or modify local tools to reduce losses and vulnerability from profiled hazards.

A capability assessment was conducted for DWD and participating jurisdictions' authorities, policies, programs, and resources. Goals and mitigation actions were developed using input from this assessment.

The Local Planning Team assessed the District's capabilities that can contribute to the reduction of long-term vulnerabilities to hazards. The capabilities include the following categories:

[2] Diablo Water District. (2020). Diablo Water District 2020 Facilities Plan. Retrieved from https://diablowater.org/doc/2070/.

- Planning and Regulatory Capabilities
- Administrative and Technical Capabilities
- Financial Capabilities
- Education and Outreach Capabilities

Additionally, ways to expand on and improve these existing policies and programs to integrate hazard mitigation into the day-to-day activities and programs of the District were considered.

5.1. Planning and Regulatory Capabilities

These include local ordinances, policies, and laws to manage growth and development (e.g., land use plans, capital improvement plans, transportation plans, emergency preparedness and response plans, building codes, and zoning ordinances). The description section of each Planning and Regulatory Capability includes a paragraph on expansion, implementation, and improvement. **Table 3** contains a list of legal and regulatory capabilities.

Table 3. Planning and Regulatory Capabilities

Emergency Response Plan			
The Emergency Response Plan (ERP) describes strategies, resources, plans, and procedures utilities can use to prepare for and respond to an incident, natural or human-caused, that threatens life, property, or the environment. Incidents can range from small main breaks or localized flooding, earthquakes, or system contamination, among other examples. The American Water Infrastructure Act (AWIA) requires community (drinking) water systems serving more than 3,300 people to develop or update Risk and Resilience Assessments (RRAs) and ERPs. **Expansion, Implementation, and Improvement:** This Hazard Mitigation Plan will be used as an essential tool to update the ERP. The latest Hazard Mitigation Plan hazards descriptions will be included. Mitigation actions that are preparedness and response in nature will be analyzed for applicability and inclusion in the description of ERP processes and procedures.			
Updated	December 2021	**Hazards Addressed**	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire
Risk and Resilience Assessment of the Water System Report			
The RRA describes the methodology and results of the assessment. The United States Environmental Protection Agency (EPA) intends to retire the vulnerability assessments prepared in response to the Bioterrorism Act to be replaced by the risk and resilience assessments prepared under AWIA. The AWIA requires community (drinking) water systems serving more than 3,300 people to develop or update RRAs and ERPs. **Expansion, Implementation, and Improvement:** This Hazard Mitigation Plan will be used as an essential tool to update the RRA. The latest Hazard Mitigation Plan hazards descriptions will be included. Mitigation actions that are preparedness and response in nature will be analyzed for applicability and inclusion in the description of RRA processes and procedures.			
Updated	June 2021	**Hazards Addressed**	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire

Facilities Plan			
The Diablo Water District (DWD) Facilities Plan, updated in 2020, provides current water demand projections, identifies facilities to serve future growth, and provides phased capital improvement projects for implementation of improvements. **Expansion, Implementation, and Improvement:** The Facilities Plan will be reviewed based on developing trends in identified hazards and mitigation measures that can make them more effective at preventing losses.			
Updated	June 2020	**Hazards Addressed**	Climate Change, Drought, Dam and Levee Failure, Sea Level Rise
Standards and Specifications			
The Standards and Specifications, updated in 2022, provides guidance and information to developers and contractors installing and/or working on the District's facilities to ensure that best practices are being followed and installation of the proper materials. **Expansion, Implementation, and Improvement:** The Standards and Specifications must be modified and updated to reflect changes in development.			
Updated	October 2022	**Hazards Addressed**	Climate Change, Drought, Dam and Levee Failure, See Level Rise
Urban Water Management Plan			
The Urban Water Management Plan (UWMP), updated in 2020, serves as a planning document for DWD's service area and discusses the water system, supply sources, historical water use, conservation efforts, projected water use compared to water supply sources for the next 20 years, and projected supply reliability during normal, dry, and drought conditions. **Expansion, Implementation, and Improvement:** This Hazard Mitigation Plan will be used as an essential tool to update the UWMP. Mitigation actions that are preparedness and response in nature will be analyzed for applicability and inclusion in the description of UWMP processes and procedures.			
Updated	May 2020	**Hazards Addressed**	Climate Change, Drought
California Water Agency Response Network			
DWD is a member of California Water Agency Response Network (CalWARN) which provides mutual aid resources and information from other water agencies for emergency response. **Expansion, Implementation, and Improvement:** This Hazard Mitigation Plan will be used as an essential supporting tool when participating in the CalWARN.			
Updated	Ongoing	**Hazards Addressed**	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire

5.2. Administrative and Technical Capabilities

The administrative and technical capabilities include community (i.e., public and private) staff and their skills and tools, which can be used for mitigation planning and implementation. This capability includes engineers, planners, emergency managers, GIS analysts, building inspectors, grant writers, and floodplain managers. Small communities may rely on other government entities, such as counties or special districts, for resources. These capabilities may be used to support mitigation activities. **Table 4** lists administrative and technical capabilities.

Table 4. Administrative and Technical Capabilities

Geographic Information System	
Geographic Information Systems (GIS) provide complex mapping and data management of DWD facilities, land use and potential hazards. Supports visualization of complex data sets using geo-location and data correlation. **Expansion and Improvement:** Acquire and conduct training for GIS technicians on the latest versions of ArcGIS.	
Department	Diablo Water District (Forward Planning Department), Diablo Water District IT Engineering Consultant, Diablo Water District Asset Management Consultant

5.3. Financial Resources

Table 5 contains a list of financial capabilities available to the District. These financial resources may be used to support mitigation activities based on procedures for each resource.

Table 5. Financial Resources

General Operating Fund	
The District's General Operating Fund includes revenue from water sales, service charges, miscellaneous income, interest, rental income, and reimbursements from well systems and developers. **Expansion and Improvement:** Hazard mitigation projects may be considered during the annual budgeting process for funding from the General Operating Fund.	
Administrator	Diablo Water District (Finance Department)
Development Facility Reserve Fund	
DWD collects Facilities Reserve charges from each new connection which are used for improvements to the District's distribution system or to buy into the existing infrastructure and water supply. **Expansion and Improvement:** Hazard mitigation projects may be considered during the annual budgeting process for funding from the Development Facility Reserve Fund.	
Administrator	Diablo Water District (Forward Planning Department, Diablo Water District Finance Department)
Community Development Block Grant	
The Community Development Block Grant (CDBG) Program provides funding for eligible senior activities such as in-home care, art classes, counseling, and home-delivered meals. The United States Department of Housing and Urban Development (HUD) also provides Disaster Recovery Assistance in the form of flexible grants to help cities, counties, and states recover from Presidentially Declared Disasters, especially in low-income areas, subject to the availability of supplemental appropriations. **Expansion and Improvement:** Where applicable, CDBG should be used to fund mitigation projects that enhance the resiliency of low income and underserved communities.	
Administrator	United States Department of Housing and Urban Development, Diablo Water District (Finance Department and Forward Planning Department)
Hazard Mitigation Grant Program	
The Hazard Mitigation Grant Program (HMPG) provides support for post-disaster mitigation plans and projects. **Expansion and Improvement:** Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.	
Administrator	Federal Emergency Management Agency, Diablo Water District (Finance Department and Forward Planning Department)

Building Resilient Infrastructure and Communities	
Building Resilient Infrastructure and Communities (BRIC) provides support for pre-disaster mitigation plans and projects. **Expansion and Improvement:** Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.	
Administrator	Federal Emergency Management Agency, Diablo Water District (Finance Department and Forward Planning Department)
Flood Mitigation Assistance Grant Program	
The Flood Mitigation Assistance (FMA) Grant Program mitigates structures and infrastructure with repetitive losses. **Expansion and Improvement:** Train staff on notice of intent (NOI) procedures and track opportunities on the California OES mitigation website to initiate applications for grant funding.	
Administrator	Federal Emergency Management Agency, Diablo Water District (Finance Department and Forward Planning Department)

5.4. Education and Outreach Capabilities

Table 6 lists the District's education and public outreach capabilities. These capabilities include fire safety programs, hazard awareness campaigns, public information, and communications offices. Education and outreach capabilities can be used to inform the public about current and potential mitigation activities.

Table 6. Education and Outreach Resources

District's Website *www.diablowater.org*	
DWD has educational material regarding water conservation and drought information. **Expansion and Improvement:** Develop a comprehensive program to utilize social media to reach out to communities in the District to provide information on mitigation activities.	
Lead Organization	Diablo Water District

6. HAZARD MITIGATION PLAN INTEGRATION

The information on hazards, risk, vulnerability, and mitigation contained in this Hazard Mitigation Plan is based on the best available data at the time of the Plan update. Plan integration consists of the incorporation of hazard mitigation into other relevant planning mechanisms (e.g., general planning and capital improvement planning). It includes the integration of natural hazard information and mitigation policies, principles, and actions into local planning mechanisms and vice versa. Additionally, plan integration is achieved though the involvement of key staff and community officials in collaborative hazard mitigation planning. This section describes the District's process for integrating information from this Hazard Mitigation Plan into other planning mechanisms.

6.1. Past Plan Integration

In the performance period since the adoption of the previous Hazard Mitigation Plan, DWD made progress on integrating components of the hazard mitigation strategy (e.g., goals, objectives, and actions) into the planning initiatives listed in **Table 7**.

Table 7. Past Plan Integration

Planning Initiative	Description
Urban Water Management Plan	This Hazard Mitigation Plan was used as an essential tool to update the Diablo Water District Urban Water Management Plan (UWMP). The UWMP, updated in 2020, includes water demands, water supply reliability and the Water Shortage Contingency Plan.

6.2. Potential Future Integration

As the Hazard Mitigation Plan is implemented, the District will use information from the Plan as the best available science and data on hazards. The capability assessment presented in Section 5 of this Annex identifies codes, plans, and programs that provide opportunities for integration. The countywide and local action plans developed for this Hazard Mitigation Plan are related to plan integration. The capability assessment identified plans and programs, listed in **Table 8**, that do not currently integrate goals and recommendations of this Plan but provide opportunities to do so in the future.

Table 8. Potential Future Integration

Planning Initiative	Description
Post-Disaster Recovery Plan	DWD is in the process of reviewing and updating the Post-Disaster Recovery Plan by utilizing current techniques and procedures. The goal is to make the process of recovery more convenient for District customers/residents. Information from this Hazard Mitigation Plan will be incorporated, as appropriate.
Emergency Operations Plan	DWD is in the process of revising the Emergency Operations Plan (EOP) using information gathered from this Hazard Mitigation Plan to improve areas that may have outdated data (e.g., hazard descriptions). The District will also work with the City of Oakley and other local agencies to improve the EOP.
Facilities Plan	The DWD Facilities Plan, updated in 2020, provides water demand projections, identifies facilities to serve future growth, and provides phased capital improvement projects for implementation of improvements. The Facilities Plan will be reviewed based on development trends in identified hazards and mitigation measures in this Hazard Mitigation Plan.

The District's Local Planning Team will identify all relevant planning initiatives that are scheduled to be updated in the next year and during the annual update process of the Hazard Mitigation Plan. Additionally, opportunities to integrate key elements of the Hazard Mitigation Plan, specifically any relevant strategies, into the planning initiatives will be identified by the Local Planning Team. Mitigation actions were identified to promote plan integration in future revisions of this Plan.

7. SIGNIFICANT HAZARD PAST EVENTS

A complete risk assessment, including past incidents, for each identified hazard of concern can be found in **Volume 1 (Planning Area-wide Elements)** of this Plan. **Table 9** provides information on significant hazard events that uniquely impacted DWD.

Table 9. Significant Past Events

Date	Event Type	Description
2021	Drought	The significant affects include lower groundwater levels which causes degradation of water quality and increased operation costs along with reduced revenue from water sales brought on by water reductions/conservation.

Date	Event Type	Description
2015	Drought	The significant affects include lower groundwater levels which causes degradation of water quality and increased operation costs along with reduced revenue from water sales brought on by water reductions/conservation. DWD reported approximately $2 Million in damages.
2009	Drought	The significant affects include lower groundwater levels which causes degradation of water quality and increased operation costs along with reduced revenue from water sales brought on by water reductions/conservation. DWD reported approximately $585,000 in damages.
1990	Drought	The significant affects include lower groundwater levels which causes degradation of water quality and increased operation costs along with reduced revenue from water sales brought on by water reductions/conservation.
December 20, 1990	Severe Weather	As a result of the severe weather events, DWD reported approximately $50,000 in damages.

8. NATIONAL FLOOD INSURANCE PROGRAM

As a special district, DWD is not eligible to participate in FEMA's National Flood Insurance Program (NFIP). Further information on Contra Costa County's NFIP and Community Rating System (CRS) participation is available on **Volume 1 (Planning Area-wide Elements)** of this Plan.

9. HAZARD VULNERABILITY AND IMPACT ASSESSMENT

Exposure and vulnerability to certain hazards affect the entire County and others are geographically defined. Although the entire County may be vulnerable to these hazards, their impacts may vary based on existing community conditions (e.g., underserved, or functional access needs populations may be more susceptible based on certain conditions, vulnerabilities, or needs).

The Local Planning Team identified ***unique vulnerabilities and impacts*** to the following natural hazards, based on the hazards profiled in **Volume 1 (Planning Area-wide Elements)**.

- Climate Change
- Dam and Levee Failure
- Drought
- Earthquake
- Flood *(riverine/creek, urban/flash flood)*
- Landslide
- Sea Level Rise
- Severe Weather *(heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado)*
- Wildfire

It was determined that the planning area did not have unique vulnerabilities and impacts to the following natural hazards; rather, its vulnerability and impacts are consistent with those experienced throughout the County.

- Tsunami

Note: Severe weather and flooding are profiled as the two (2) hazards. However, in an effort to have a more thorough risk assessment, the sub hazards (i.e., heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado, riverine/creek flooding, and urban/flash flooding) were ranked individually. The hazard risk assessment methodology can be found in **Appendix C** of this Annex.

Table 10 provides information on several key vulnerabilities and impacts for DWD and only addresses the hazards that are relevant and unique to the jurisdiction. A complete risk assessment for each identified hazard of concern is in **Volume 1 (Planning Area-wide Elements)** of this Plan. Hazard mapping can be found in **Appendix A** of this Annex.

Table 10. Hazard Vulnerability and Impact Assessment

Hazards	Vulnerabilities and Impacts
Climate Change	Any water supplies that depend on natural hydrology, especially mountain snowpack, are typically considered vulnerable to the effects felt from climate change. Climate change is expected to increase in the duration of heat waves and droughts, evapotranspiration, and increase in the frequency of high volume/intense storms in the winter. Impacts are expected to affect water quality and quantity in the Delta, which serves as 80% of DWD source water. The low income households and households in poverty population within the District may lack access to alternative water supplies making them more vulnerable to the disruptions caused by climate change. These communities lack the resources to manage increased water costs, making them more susceptible to shortages, during an extended heat wave, drought period, and during/after severe weather. Limited access to cooling centers, healthcare, and financial resources makes these communities susceptible to heat stress, water shortages, and other climate related impacts. Additionally, this underserved population may live in areas more prone to flooding or drought, with limited access to mitigation measures (e.g., water-saving technologies or emergency supplies). Low income households are those with an income of 80% or less of the median income and households in poverty are those with an income below the poverty line, which is $24,300 for a household of four (4).[3]

[3] Contra Costa County. (2023). Climate Action Plan (Public Review Draft). Retrieved from https://envisioncontracosta2040.org/wp-content/uploads/2023/10/CoCoCounty-2024CAP-PublicDRAFT-10-10-23_Final.pdf.

Hazards	Vulnerabilities and Impacts
Dam and Levee Failure	A breach in a section of a levee in the northeast portion of the system could cause flooding from the San Joaquin River. The breach could be caused by soil loss due to infiltration through the levee, growth in the levee, disrepair or inadequate maintenance, and sea level rise coupled with a significant storm event. Structures that reside in the potential inundation area are the Delta Coves Chemical Feed Facility and Willow Park Marina (M-27) Well Station. In the event of a levee breach, underserved populations living near or within the affected areas may not have the resources to evacuate or rebuild. The population is most vulnerable during periods of heavy rainfall, coastal flooding, or rapid snowmelt. These individuals may reside in low income housing located within the flood prone zones (i.e., levee inundation areas) due to economic limitations. The costs associated with flood insurance, relocation, and recovery may further strain these populations. Recovery times are also extended for underserved populations due to limited access to financial assistance and emergency housing. Furthermore, many of the households in poverty and low income population is most likely to live in low-lying areas and in structures that may not be waterproofed or built to the 100-year flood elevation.[4]
Drought	Drought can lead to lower groundwater levels and reduce surface water supply. Subsequently, low groundwater levels present risks of saltwater intrusion, over drafting potential at wells, and degrading water quality of source water supplies. These impacts can increase operation costs for Delta Coves Chemical Feed and Blending Facility, disincentives to encourage water conservation from customers which leads to reduced revenue, increased costs for treated water from RBWTP, and potential increased costs for water quality testing. Reduced groundwater and increased water costs can result in water insecurity or water rationing within the underserved population. This population is most vulnerable during extended droughts when water supply becomes limited and more expensive. Drought periods can also lead to prolonged water conservation measures affecting the population struggling to afford basic utilities. These populations may also struggle with accessing alternative water sources, leading to increased health and sanitation risks.

[4] Ibid.

Hazards	Vulnerabilities and Impacts
Earthquake	Large seismic earthquake events can damage above ground facilities and cause damage to underground pipes. Additionally, ground subsidence could result in settlement of pipes and increase the potential for main water breaks. Areas with liquefying soils, such as the ones listed below with an asterisk, are at high risk of this occurrence. • District Office* • Corporation Yard* • Blending Facility • Delta Coves Chemical Feed Facility* • Knightsen (M-25) Well Station* • Glen Park Well Station* • Stonecreek Well Station* • R-1 Reservoir • R-2 Reservoir • R-3 Reservoir • Corp Yard Pump Station* • Transmission Pipelines* • Bethel Island Bridge* In the event of an earthquake, the low income population may live in older, less-resilient housing with outdated infrastructure. If water services are disrupted, these communities might not have immediate access to bottled or water or alternatives for basic needs. Rebuilding damaged infrastructure can take longer in underserved areas due to limited financial and logistical support. Recovery times are also extended for underserved populations due to limited access to financial assistance and emergency housing.
Flood *(urban/flash flood, riverine/creek)*	Significant flooding can damage roadways, structures above ground, flood below ground vaults, cut off access to facilities, and cause ground subsidence that could result in settlement of pipes and an increased potential for water main breaks. Underserved populations, particularly those living in low income housing areas are more vulnerable to flood events due to limited access to resources for relocation, recovery, or flood protection measures. Additionally, this underserved population (i.e., low income and households in poverty) is most likely to live in low-lying areas and in structures that may not be waterproofed or built to the 100-year flood elevation. These communities may have insufficient insurance coverage and are less likely to afford flood-resistant upgrades or repairs. Recovery times are also extended for underserved populations due to limited access to financial assistance and emergency housing.

Hazards	Vulnerabilities and Impacts
Landslides	Landslides can cut off access to roads, damage above ground structures, and cause water main breaks in steep slope areas that experience ground movement. Landslides and mudslides are typically a concern for assets that are located on a hillside or are downhill of a hill/slope. Landslide susceptibility modeling completed in 2011 shows DWD lies within a low probability zone. However, the access road to R-2 Reservoir and R-3 Reservoir may be vulnerable. Vulnerability increases during and after heavy rainfall, snowmelt, or seismic events, when ground instability is highest. These times create significant challenges for underserved populations, especially in rural or isolated areas with limited evacuation routes. Additionally, households in poverty may live in homes that are less structurally sound. Recovery times are also extended for underserved populations due to limited access to financial assistance and emergency housing. The elderly population (65 years old and over) may lack access to social connections and community support that can assist in preparing for and responding to emergency events, evacuating, improving home resiliency, managing medical needs, and locating support services (e.g., water resources).[5]
Sea Level Rise	Corrosion potential increases on metallic piping where sea water intrudes into the drinking water aquifer. In addition, sea water intrusion can permanently reduce the drinking water aquifer area. Since DWD receives most of their supplies from surface water sources, the likelihood of saltwater intrusion impacting the primary water supply to DWD was ranked low. Populations are most vulnerable during high tide events, storm surges, and ongoing sea level rise. Over time, as saltwater intrusion progresses, long-term impacts include loss of freshwater access, impacting drinking water availability for lower-income communities. They are less likely to have the financial means to relocate or to retrofit homes to withstand saltwater intrusion, leading to a loss of property and displacement. Sea level rise can exacerbate other hazards (e.g., coastal flooding, freshwater flooding) which can impact the water supply for the underserved communities.

[5] Ibid.

Hazards	Vulnerabilities and Impacts
Severe Weather *(heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado)*	Strong winds can damage water supply facilities above ground and cause power outages. This has been evaluated due to its ability to impact the SCADA. Similar to flooding, severe weather events can be a combination of heavy rainfall, extreme heat/heat waves, or strong winds. Severe weather could damage above ground facilities, cut off access to facilities, and cause power outages. Severe weather impacts to the DWD infrastructure uniquely affect underserved communities, especially those in areas with older and less resilient infrastructure. Power outages can have lasting impacts, especially for individual's dependent on electricity for medical equipment or cooling systems during extreme heat. Lack of emergency resources (e.g., backup power, shelter, and food supplies) also increases the risk. Recovery times are also extended for underserved populations due to limited access to financial assistance and emergency housing.
Tsunami	The Local Planning Team determined that the District does not have unique vulnerabilities and impacts to tsunamis; rather, the District's vulnerability and impacts are consistent with those experienced throughout the County.
Wildfire	Wildfire near or directly at DWD facilities could cause loss of power, cut off access, and damage equipment. A large-scale wildfire can deplete the water storage quickly (more than one (1) hydrant full open) compounded by also impacting the power supply and equipment of the critical assets. Based on Cal Fire's Fire and Resource Assessment Program, the majority of DWD's facilities are within low and moderate risk zones (return interval of greater than 350 years, and between 250 and 350 years, respectively). The key infrastructure listed with an asterisk are within high and very high-risk zones. • Delta Coves Chemical Feed Facility • Knightsen (M-25) Well Station • Willow Park Marina (M-27) Well Station • R-2 Reservoir* • R-3 Reservoir* Impacts from wildfire to the DWD infrastructure can impact the water supply distribution to customers which can significantly impact the underserved populations within the District. Particularly the underserved population that is located in rural or remote areas near high-risk wildfire zones, are at heightened risk from wildfires due to limited access to emergency services, evacuation routes, and communication networks. Vulnerability increases during wildfire season, typically in late summer and fall, when dry conditions heighten the risk of fires. Extreme weather events like high winds can spread wildfires quickly. These communities may also lack the financial resources to implement fire prevention measures such as defensible space around homes. Additionally, prolonged power outages caused by wildfires can disproportionately affect those with medical needs, limited access to emergency supplies, and reliance on critical infrastructure like water services. Recovery times are also extended for underserved populations due to limited access to financial assistance and emergency housing.

Hazards	Vulnerabilities and Impacts
Active Shooter Incidents	A physical assault on utility infrastructure or staff with the intent of disabling infrastructure and/or terrorizing staff is always a possibility.
Cybersecurity Threats	A cyberattack on utility billing, communications, data management or other information systems, which may disable affected systems and result in the loss of information resources (e.g., personal, financial, and other sensitive data), and other economic consequences for the utility. This threat was assessed qualitatively. The United States Environmental Protection Agency (EPA) estimates water utilities experience an attempted cyberattack on a business enterprise system once per year, and 30% of these incidents have the potential for significant economic consequences. A cyberattack on utility process control systems, including monitoring, operations, and centralized control, may disable or manipulate utility infrastructure, potentially resulting in loss of service, the contamination of finished water and damage to utility infrastructure.
Hazardous Materials Incidents	The Local Planning Team determined that the District does not have unique vulnerabilities and impacts to hazardous materials incidents; rather, the District's vulnerability and impacts are consistent with those experienced throughout the County.
Terrorism (Weapons of Mass Destruction)	An intentional incident of contamination of a drinking water source that could result in contaminated water entering the utility is a vulnerability. This applies to surface and groundwater sources. An incident where a contaminant is deliberately introduced into the finished water storage or distribution system with the intent of poisoning consumers and/or contaminating infrastructure is also a concern.
Utility Interruptions	The Local Planning Team determined that the District does not have unique vulnerabilities and impacts to utility interruptions; rather, the District's vulnerability and impacts are consistent with those experienced throughout the County.

The District evaluated whether vulnerability and impact in hazard-prone areas had increased, decreased, or remained the same for each natural hazard identified in this Hazard Mitigation Plan. Climate change, changes in population, infrastructure expansion, and economic shifts that can affect vulnerability were considered. For example, if planned development is in an identified hazard areas or is not built to the updated building codes, it may increase the community's vulnerability to future hazards and disasters. On the other hand, if development occurred with mitigation practices in place, the vulnerability may have remained the same or decreased. Additionally, shifting demographics (e.g., underserved population) were taken into consideration.

Table 11 outlines if climate change has increased or decreased the District's vulnerability/exposure and impact to each natural hazard over the past five (5) years, and the effect of climate change in the future probability of occurrence and impacts from each natural hazard.

Table 11. Climate Change Current and Future Vulnerability and Impact

Hazard	Vulnerability and Impact
Current Vulnerability and Impact	
Climate Change	Increased

Hazard	Vulnerability and Impact
Dam and Levee Failure	Increased
Drought	Increased
Earthquake	Remained the Same
Flood *(urban/flash flood, riverine/creek)*	Increased
Landslide	Increased
Sea Level Rise	Increased
Severe Weather *(heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado)*	Increased
Tsunami	Remained the Same
Wildfire	Increased
Future Vulnerability and Impact	
Climate Change	Increase
Dam and Levee Failure	Increase
Drought	Increase
Earthquake	No Change is Anticipated
Flood *(urban/flash flood, riverine/creek)*	Increase
Landslide	Increase
Sea Level Rise	Increase
Severe Weather *(heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado)*	Increase
Tsunami	No Change is Anticipated
Wildfire	Increase

Table 12 outlines if changes in population within the District over the past five (5) years have increased or decreased the vulnerability/exposure and impact to these natural hazards, and the anticipated effects changes in population may have on the future probability of occurrence and impacts from these natural hazards.

Table 12. Changes in Population Current and Future Vulnerability and Impact

Hazard	Vulnerability and Impact
Current Vulnerability and Impact	
Climate Change	Increased
Dam and Levee Failure	Increased
Drought	Increased
Earthquake	Remained the Same
Flood *(urban/flash flood, riverine/creek)*	Remained the Same
Landslide	Remained the Same

Hazard	Vulnerability and Impact
Sea Level Rise	Remained the Same
Severe Weather *(heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado)*	Remained the Same
Tsunami	Remained the Same
Wildfire	Remained the Same
Future Vulnerability and Impact	
Climate Change	Increase
Dam and Levee Failure	Increase
Drought	Increase
Earthquake	No Change is Anticipated
Flood *(urban/flash flood, riverine/creek)*	No Change is Anticipated
Landslide	No Change is Anticipated
Sea Level Rise	No Change is Anticipated
Severe Weather *(heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado)*	No Change is Anticipated
Tsunami	No Change is Anticipated
Wildfire	No Change is Anticipated

Table 13 outlines if development over the past five (5) years has increased or decreased the jurisdiction's vulnerability/exposure and impact to these natural hazards, and the anticipated effects changes in development may have on the future probability of occurrence and impacts from these natural hazards.

Table 13. Changes in Development Current and Future Vulnerability and Impact

Hazard	Vulnerability and Impact
Current Vulnerability and Impact	
Climate Change	Increase
Dam and Levee Failure	Increase
Drought	Increase
Earthquake	Remained the Same
Flood *(urban/flash flood, riverine/creek)*	Remained the Same
Landslide	Remained the Same
Sea Level Rise	Remained the Same
Severe Weather *(heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado)*	Remained the Same
Tsunami	Remained the Same
Wildfire	Remained the Same
Future Vulnerability and Impact	
Climate Change	Increase

Hazard	Vulnerability and Impact
Dam and Levee Failure	Increase
Drought	Increase
Earthquake	No Change is Anticipated
Flood *(urban/flash flood, riverine/creek)*	No Change is Anticipated
Landslide	No Change is Anticipated
Sea Level Rise	No Change is Anticipated
Severe Weather *(heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, tornado)*	No Change is Anticipated
Tsunami	No Change is Anticipated
Wildfire	No Change is Anticipated

The District anticipates future major assets may be exposed or vulnerable to any of the natural hazards identified in this Hazard Mitigation Plan. **Table 14** outlines the major assets the District expects may be exposed or vulnerable.

Table 14. Vulnerable Assets

Hazard	Asset
Dam and Levee Failure, Drought, Heat Wave/Extreme Heat	New residents including underserved individuals and socially vulnerable individuals within the service area. Any new construction in hazard prone areas could be vulnerable.

Refer to **Appendix C** and **Appendix D** of this Annex for the hazard risk assessment methodology and jurisdiction specific details, which includes the vulnerability and impacts to population and life safety, underserved/equity, property damage, future development, and climate change.

9.1. FEMA National Risk Index

In the National Risk Index (NRI), risk is defined as the potential for negative impacts as a result of a natural hazard. The Risk Index is based on three (3) components – a natural hazards component (Expected Annual Loss), a consequence enhancing component (Social Vulnerability), and a consequence reduction component (Community Resilience). Using these components, the composite and hazard type Risk Index values are calculated for each community (county and Census Tract). Risk Index values form an absolute basis for measuring Risk within the NRI and are used to generate Risk Index percentiles and ratings across communities.[6] **Table 15** illustrates the Risk Index rating and score for the DWD planning area boundary.

Note: *ArcGIS mapping analysis was performed utilizing Census Tract data by overlaying Census Tracts with the DWD planning area boundary. The information outlined in this section includes data from the Census Tracts that intersect the jurisdiction.*

[6] Federal Emergency Management Agency. (2023). Determining Risk. Retrieved from https://hazards.fema.gov/nri/determining-risk.

Table 15. Risk Index Score (FEMA National Risk Index)

Jurisdiction	Rating	Score
Diablo Water District	Very High	80.8
Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience (Expected Annual Loss x Social Vulnerability / Community Resilience = Risk Index).		

9.1.1. Expected Annual Loss

The FEMA NRI Expected Annual Loss (EAL), the natural hazards component of the NRI, represents the average economic loss in dollars resulting from natural hazards each year. It is calculated for each hazard type and quantifies loss for relevant consequence types – buildings, people, and agriculture. The EAL score and rating represent a community's relative level of expected losses each year when compared to all other communities at the same level. Since the score is associated to a community's risk; the higher EAL score results in a higher Risk Index score.[7] **Table 16** illustrates each hazard EAL for the DWD planning area boundary.

Table 16. Expected Annual Loss *(FEMA National Risk Index)*

Hazard	Population Equivalence	Building Value	Agriculture Value	Total Expected Annual Loss	Expected Annual Loss Score	Rating
Coastal Flooding *(Sea Level Rise)*	$0	$0	n/a	$0	0.0	No Expected Annual Losses
Drought	n/a	n/a	$711,018	$711,018	94.3	Very High
Earthquake	$304,211	$854,269	n/a	$1.2 Million	93.0	Very High
Hail *(Severe Weather)*	$60	$196	$92	$348	30.5	Relatively Low
Heat Wave *(Severe Weather)*	$13,974	$2	$1,347	$15,323	62.1	Relatively Moderate
Landslide	$3	$25	n/a	$28	13.3	Very Low
Riverine Flooding *(Flood)*	$54,673	$61,129	$25,648	$141,449	68.5	Relatively High
Strong Winds *(Severe Weather)*	$73	$22	$5	$101	6.0	Very Low
Tornado *(Severe Weather)*	$1,890	$3,917	$15	$5,822	17.0	Very Low
Tsunami	$0	$0	n/a	$0	0.0	No Expected Annual Losses

[7] Federal Emergency Management Agency. (2023). Expected Annual Loss. Retrieved from https://hazards.fema.gov/nri/expected-annual-loss.

Hazard	Population Equivalence	Building Value	Agriculture Value	Total Expected Annual Loss	Expected Annual Loss Score	Rating
Wildfire	$58	$2,026	$0	$2,084	29.5	Relatively Low
Expected annual loss scores are calculated utilizing an equation that combines values for exposure, annualized frequency, and historic loss ratios (Expected Annual Loss = Exposure x Annualized Frequency x Historic Loss Ratio).						

An EAL score and rating is calculated independently for each consequence type (i.e., buildings, population, and agriculture) for each county and Census Tract. The population EAL is measured in fatalities and injuries while the building and agriculture values are measured in dollars. However, for consistency in the unit of measurement, the population EAL was monetized into population equivalence using a value of statistical life (VSL) approach where each fatality or 10 injuries is treated as $11.6 Million of economic loss.

9.1.2. Social Vulnerability

Social vulnerability, the consequence enhancing risk component of the NRI, measures the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood. The Social Vulnerability score and rating represent the relative level of a community's social vulnerability compared to all other communities at the same level. A higher Social Vulnerability score results in a higher Risk Index score.[8] **Table 17** illustrates the Social Vulnerability rating and score for the DWD planning area boundary.

Table 17. Social Vulnerability *(FEMA National Risk Index)*

Jurisdiction	Rating	Score
Diablo Water District	Relatively Moderate	43.1
Social Vulnerability is measured using the Social Vulnerability Index (SoVI) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).		

9.1.3. Community Resilience

Community resilience, the consequence reduction risk component, measures the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions. The Community Resilience score and rating represent the relative level of a community's resilience compared to all other communities at the same level. Since the score is inversely proportional to a community's risk; the higher Community Resilience score results in a lower Risk Index score.[9] **Table 18** illustrates the Community Resilience rating and score for the DWD planning area boundary.

[8] Federal Emergency Management Agency. (2023). Social Vulnerability. Retrieved from https://hazards.fema.gov/nri/social-vulnerability.
[9] Federal Emergency Management Agency. (2023). Community Resilience. Retrieved from https://hazards.fema.gov/nri/community-resilience.

Table 18. Community Resilience *(FEMA National Risk Index)*

Jurisdiction	Rating	Score
Diablo Water District	Relatively High	66.4
Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).		

9.1.4. Annualized Frequency

Annualized frequency is defined as the expected frequency or probability of a hazard occurrence per year. It is a natural hazard incidence factor for Expected Annual Loss, the natural hazards component of the National Risk Index. A higher annualized frequency value results in higher Expected Annual Loss and Risk Index scores. The annualized frequency is derived from either the number of recorded hazard occurrences each year over a given period or the modeled probability of a hazard occurrence each year (e.g., earthquake).[10] **Table 19** outlines the annualized frequency for each hazard, based on FEMA NRI data, for the DWD planning area boundary.

Table 19. Hazard Annualized Frequency *(FEMA National Risk Index)*

Hazard	Period of Record	Events on Record	Annualized Frequency
Coastal Flooding *(Sea Level Rise)*	Various datasets	n/a	0.0 events per year
Drought	22 years	1,369	62.2 events per year
Earthquake	2021 dataset	n/a	0.010% chance per year
Hail *(Severe Weather)*	34 years	2	0.0 events per year
Heat Wave *(Severe Weather)*	16 years	28	1.8 events per year
Landslide	12 years	0	0.0 events per year
Riverine Flooding *(Flood)*	24 years	31	1.3 events per year
Strong Winds *(Severe Weather)*	34 years	2	0.0 events per year
Tornado *(Severe Weather)*	72 years	0	0.0 events per year
Tsunami	222 years	0	0.0 events per year
Wildfire	2021 dataset	n/a	0.0% events per year

10. HAZARD RISK RANKING

Table 20 presents the local hazard ranking for DWD of all hazards of concern listed in **Volume 1 (Planning Area-wide Elements)** of this Plan. This ranking summarizes how hazards vary for this jurisdiction. As described in detail in **Volume 1 (Planning Area-wide Elements)** and **Appendix C** of this Annex, the ranking process involves an assessment of the likelihood of occurrence for each hazard, along with its potential impacts on people, property, and the economy. For further details on how the probability, extent, vulnerability, and impact factors in **Table 20** were calculated, please refer to **Appendix D** of this Annex.

[10] Federal Emergency Management Agency. (2023). Annualized Frequency. Retrieved from https://hazards.fema.gov/nri/annualized-frequency.

It is important to note that the sub hazards for severe weather hazards (i.e., heavy rainfall, severe thunderstorms, strong winds/damaging winds, heat wave/extreme heat, and tornado) and flood hazards (i.e., riverine/creek flooding and urban/flash flooding) were individually ranked in the hazard risk ranking; however, flood and severe weather are each considered as the main hazard throughout this Annex and **Volume 1 (Planning Area-wide Elements)**.

Table 20. Hazard Risk Ranking

Hazard Event	Probability Factor	Sum of Weighted Extent Factors	Sum of Weighted Vulnerability Factors	Sum of Weighted Impact Factors	Consequence Score	Total Risk Score *(Probability x Consequence)*
Earthquake	2	18	17	36	71	68
Heavy Rainfall *(Severe Weather)*	2	18	12	29	59	58
Flood (Urban/Flash Flood)	3	9	14	15	38	56
Severe Thunderstorm *(Severe Weather)*	2	15	12	29	56	55
Strong Winds/ Damaging Winds *(Severe Weather)*	2	18	11	26	55	54
Utility Interruptions	2	18	12	25	55	54
Heat Wave/Extreme Heat *(Severe Weather)*	3	6	16	14	36	54
Drought	3	9	11	16	36	54
Wildfire	2	15	11	27	53	53
Flood (Riverine/Creek)	3	9	10	15	34	51
Hazardous Materials Incidents	3	9	7	18	34	51
Landslide	2	15	11	19	45	46
Climate Change	2	12	6	20	38	40
Cybersecurity Threats	2	9	12	15	36	38
Active Shooter Incidents	2	12	7	13	32	34
Terrorism (Weapons of Mass Destruction)	2	9	5	15	29	32
Dam and Levee Failure	1	18	11	27	56	31
Sea Level Rise	1	6	9	21	36	21
Tornado *(Severe Weather)*	1	6	6	14	26	16

Hazard Event	Probability Factor	Sum of Weighted Extent Factors	Sum of Weighted Vulnerability Factors	Sum of Weighted Impact Factors	Consequence Score	Total Risk Score *(Probability x Consequence)*
Tsunami	1	6	5	13	24	15

Consequence: *Sum of all weighted factors.*
Extent: *Sum of the weighted Extent factors.*
Vulnerability: *Sum of the weighted Vulnerability factors.*
Impact: *Sum of the weighted Impact factors.*
Total Risk Score* *= Probability x Consequence*
** Normalized to 100*

Total Risk Score Legend

Classification	Probability Factor	Extent	Vulnerability	Impact	Consequence Score	Total Risk Score
Low (L)	1	0 – 6	0 – 6	0 – 12	0 – 24	0 – 24
Medium (M)	2	7 – 12	7 – 12	13 – 26	25 – 50	25 – 54
High (H)	3	13 – 18	13 – 18	27 – 39	51 – 75	55 and above

*The **legend**—specifically the assignment of low, medium, and high—provides an additional means to qualitatively assess the probability factor, sum of weighted factors, and the total risk scores for each hazard. The **Consequence Score** represents the sum of the Extent, Vulnerability, and Impact Factors. The **Total Risk Score** is a measure of Probability and Consequence.*

11. MITIGATION ACTIONS

This section includes the mitigation actions that were developed to address identified risks and vulnerabilities to hazards identified in this Plan. This Plan serves only to recommend mitigation measures based on the potential for risk reduction and available funding. Implementation of mitigation actions is dependent on risk reduction priorities, feasibility, and available funding. It is also dependent on the cooperation and support of the jurisdiction and/or department responsible for each action item.

DWD agreed upon **18** mitigation actions that apply to the jurisdiction's properties where they have jurisdictional responsibility and authority. A summary of the District's mitigation actions status is listed in **Table 21**.

Table 21. Diablo Water District Mitigation Actions Summary

Status	Mitigation Action Total
Ongoing	3
In Progress/In Work	1
Not Started	0
Delayed/Deferred	0
New	14
TOTAL	**18**
Completed	0
Deleted/No Longer Needed	0

Mitigation Actions per Hazard			
Climate Change	4	Landslide	4
Dam and Levee Failure	5	Sea Level Rise	7
Drought	6	Severe Weather	10
Earthquake	14	Tsunami	3
Flood	7	Wildfire	7
Other Hazards of Concern: Cybersecurity Threats (6), Hazardous Materials Incidents (2), Terrorism (4), Utility Interruptions (6)			

These shared actions, some of which address all hazards, help to meet the following requirements:

- Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?
- Does the Plan include one (1) or more action(s) per jurisdiction for each hazard identified within the risk assessment?

A detailed explanation of the Mitigation Strategy can be found in Chapter 5 of **Volume 1 (Planning Area-wide Elements)**.

Mitigation Action	Purchase emergency response equipment, to include, but not limited to, satellite phones/emergency radios.				
Action Number	DWD-1	**Year Initiated / Anticipated Year of Initiation**	2024	**Prioritization Score**	High
Goal(s) / Objective(s) Addressed		**Goals:** 1, 3, 4, 5 **Objectives:** 2, 13	**Hazard(s) Mitigated**	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire	
Project Status		Ongoing	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		Low			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Short Term		**Estimated Cost**	Low	
Potential Funding Source	Local Budgeted Funds, HMGP, BRIC, FMA, FEMA PA		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Conduct a drought education outreach to residents/customers with literature/information regarding water conservation; provide free water saving devices (e.g., low flow shower heads, aerator adaptors for kitchen faucet, garden nozzles, etc.), lawn to garden rebates, and personalized assistance.				
Action Number	DWD-2	**Year Initiated / Anticipated Year of Initiation**	2024	**Prioritization Score**	High
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5 **Objectives:** 2, 6, 18	**Hazard(s) Mitigated**	Drought	
Project Status		Ongoing	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Ongoing		**Estimated Cost**	Low	
Potential Funding Source	Local Budgeted Funds, HMGP, BRIC, FEMA PA		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Retrofit or relocation of structures in high hazard areas, prioritizing structures that have experienced repetitive losses. Specifically target retrofit of Reservoir 1 and Reservoir 2.				
Action Number	DWD-3	**Year Initiated / Anticipated Year of Initiation**	2025	**Prioritization Score**	High
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5 **Objectives:** 1, 4, 7, 9, 12, 14, 15, 17	**Hazard(s) Mitigated**	Earthquake, Flood, Severe Weather	
Project Status		In Progress/In Work	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	Local Budgeted Funds, HMGP, BRIC, FY2023 PDM		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*	Phase 1 of Reservoir 2's retrofit has been completed. Currently, an application is in progress for Phase 2 of the retrofit (FY23 LPDM). Additional details of the Reservoirs retrofit are outlined in actions DWD-17 and DWD-18.		

Mitigation Action	Actively participate in the Hazard Mitigation Plan maintenance protocols outlined in Volume 1 of the Contra Costa County Hazard Mitigation Plan.				
Action Number	DWD-4	**Year Initiated / Anticipated Year of Initiation**	2018 or before	**Prioritization Score**	High
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5 **Objectives:** 3, 8, 16	**Hazard(s) Mitigated**	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Tsunami, Wildfire	
Project Status		Ongoing	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		Low			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Short Term		**Estimated Cost**	Low	
Potential Funding Source	Local Budgeted Funds		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Construct a secondary parallel pipeline from the Reservoirs 2 and 3 to mitigate a pipeline failure from our tank storage site – A 24-inch single transmission pipeline in from Reservoirs 2 and 3 to Neroly Road enters Randall – Bold Water Treatment Plant.				
Action Number	DWD-5	**Year Initiated / Anticipated Year of Initiation**	2025	**Prioritization Score**	28/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Earthquake, Sea Level Rise, Cybersecurity Threats, Utility Interruptions	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	HMGP, BRIC, FEMA PA		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	N/A	
Implementation Priority	Medium	**Integration Ideas** *(Optional)*			

Mitigation Action	Construct two (2) emergency standby groundwater wells.				
Action Number	DWD-5	**Year Initiated / Anticipated Year of Initiation**	2025	**Prioritization Score**	28/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Drought	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	HMGP, BRIC, FEMA PA		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	N/A	
Implementation Priority	Medium	**Integration Ideas** *(Optional)*			

Mitigation Action	Implement monitoring procedures, apply soil stabilization measures (e.g., planting soil-stabilizing vegetation), and create a plan to reinforce high risk areas the access road leading to Reservoir 2 and 3 is most vulnerable to. This access road is a single point of entry and vulnerable to disruptions from landslides and earthquakes.				
Action Number	DWD-6	**Year Initiated / Anticipated Year of Initiation**	2026	**Prioritization Score**	32/40
Goal(s) / Objective(s) Addressed		**Goals:** 2, 3	**Hazard(s) Mitigated**	Earthquake, Landslide, Severe Weather	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Short Term		**Estimated Cost**	Medium	
Potential Funding Source	Local Budgeted Funds, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Construct a parallel transmission pipeline to mitigate pipeline failure of the single transmission pipeline coming out of Randall-Bold Water Treatment Plant. The single transmission pipeline is a 500 LF of 30-inch steel pipe distributing water into the Diablo Water District's main distribution system.				
Action Number	DWD-7	**Year Initiated / Anticipated Year of Initiation**	2027	**Prioritization Score**	35/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Earthquake, Flood, Cybersecurity Threats	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	Local Budgeted Funds, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	A parallel transmission pipeline needs to be installed and a full exercise of larger diameter valves needs to be implemented to mitigate these hazards. A 24-inch single transmission pipeline along East. Cypress Road is approximately two (2) miles of mostly ductile iron pipe. An earthquake could cause main breaks and sea level rise could create a wet/dry corrosive environment on the pipes. The 24-inch single transmission pipeline is the only source of potable water for tens of thousands of residents.				
Action Number	DWD-8	**Year Initiated / Anticipated Year of Initiation**	2025	**Prioritization Score**	37/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Earthquake, Flood, Sea Level Rise, Severe Weather	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	Local Budgeted Funds, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Install a remote access security camera system at all Diablo Water District facilities. This action will mitigate the malevolent threats (e.g., assault, contamination, theft/diversion, sabotage), power outage, and supply chain disruption.				
Action Number	DWD-9	**Year Initiated / Anticipated Year of Initiation**	2024	**Prioritization Score**	32/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 4, 5	**Hazard(s) Mitigated**	Cybersecurity Threats, Utility Interruptions, Terrorism	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		Medium			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Short Term		**Estimated Cost**	Low	
Potential Funding Source	Local Budgeted Funds, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	An 18-inch single transmission pipeline along Bethel Island Road is the only source of potable water to the community on Bethel Island. Construct a pipeline along Sandmound Boulevard and tie-in the pipelines at the intersection of Bethel Island and Sandmound Boulevard to have the ability to back feed the distribution system from an adjacent pressure zone to mitigate pipeline failure.				
Action Number	DWD-10	**Year Initiated / Anticipated Year of Initiation**	2027	**Prioritization Score**	32/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Dam and Levee Failure, Earthquake, Flood, Sea Level Rise, Severe Weather	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	State Special Funds, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	California State Water Resources Control Board (SWRCB) Fund	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Restoration of Pumps 1 and 2 at the District's Corp Yard Pump Station which were installed in 1986. Pumps 1 and 2 are critical to the Diablo Water District's Distribution System				
Action Number	DWD-11	**Year Initiated / Anticipated Year of Initiation**	2024	**Prioritization Score**	32/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 5	**Hazard(s) Mitigated**	Earthquake, Wildfire, Utility Interruptions, Cybersecurity Threats, Terrorism	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		Medium			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Short Term		**Estimated Cost**	Medium	
Potential Funding Source	Local Budgeted Funds		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Construct a parallel transmission pipe that would cross the Delta allowing potable water distribution to the community of Bethel Island. Currently an 18-inch transmission pipe is attached to the Bethel Island Bridge and if the pipes are in generally good condition, the level of risk of the pipe failure is dependent on the condition of the bridge itself. Any seismic event that damages the bridge will likely cause sufficient movement in the pipe and often results in difficulty accessing the pipes, and the associated structural components that are attached. If the pipe on the bridge were to leak or fail, Diablo Water District does not have the proper equipment to fix the pipe. Additionally, implement an annual training for District staff on the implementation of an emergency plan to run a 6-inch hose across the Bethel Island Bridge to allow water to serve the island.				
Action Number	DWD-12	**Year Initiated / Anticipated Year of Initiation**	2030	**Prioritization Score**	31/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Earthquake, Severe Weather	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	State Special Fund, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	California State Water Resources Control Board (SWRCB) Fund	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Implement a recycled water project that may include landscape recycled water use, groundwater banking, direct potable reuse and other regulatorily permitted uses of recycled water. Drought can lead to lower groundwater levels and reduce surface water supply. Low groundwater levels present risks of saltwater intrusion, over-drafting potential at wells, degrading water quality of source water supplies.				
Action Number	DWD-13	**Year Initiated / Anticipated Year of Initiation**	2026	**Prioritization Score**	32/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 4, 5	**Hazard(s) Mitigated**	Climate Change, Drought, Sea Level Rise, Severe Weather	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	Ironhouse Sanitary District	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	Local Budgeted Funds, State Special Fund, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time), California State Water Resources Control Board (SWRCB) Fund	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Provide an emergency generator and construct a transmission pipeline with a tie-in to the District's main distribution system for back-up water supply. The Knightsen (M-25) Well consists of one (1) pump installed in 1993 with no stand-by pumps. There is no redundancy or backup water supply source feeding the Knightsen pressure zone/system.				
Action Number	DWD-14	**Year Initiated / Anticipated Year of Initiation**	2027	**Prioritization Score**	33/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Drought, Earthquake, Severe Weather, Wildfire, Hazardous Materials Incidents, Utility Interruptions	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Short Term		**Estimated Cost**	High	
Potential Funding Source	Local Budgeted Funds, State Special Fund, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time), California State Water Resources Control Board (SWRCB) Fund	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Install a back-up pump at the Glen Park Well Station. The Glen Park Well Station is the District's highest capacity well at two (2) MG and feeds into the existing (main) pressure zone. This well is capable of providing up to 20% of the District's daily water supply. The wells station consists of one (1) pump installed in 2006 with no stand-by pumps.				
Action Number	DWD-15	**Year Initiated / Anticipated Year of Initiation**	2029	**Prioritization Score**	32/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 4, 5	**Hazard(s) Mitigated**	Dam and Levee Failure, Earthquake, Wildfire, Cybersecurity Threats, Terrorism, Utility Interruptions,	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Short Term		**Estimated Cost**	High	
Potential Funding Source	State Special Fund, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	California State Water Resources Control Board (SWRCB) Fund	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Connect the Willow Park Marina (M-27) Well Station to the District's main distribution system. The Willow Park Marina (M-27) Well Station consists of two (2) chlorinated wells operated alternately supplying about 162 condominium units, one (1) clubhouse, and other miscellaneous non potable uses. Currently, the wells have a high arsenic level, and the water is not safe to drink.				
Action Number	DWD-16	**Year Initiated / Anticipated Year of Initiation**	2026	**Prioritization Score**	32/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 4, 5	**Hazard(s) Mitigated**	Climate Change, Dam and Levee Failure, Drought, Earthquake, Flood, Landslide, Sea Level Rise, Severe Weather, Wildfire, Cybersecurity Threats, Hazardous Materials Incidents, Terrorism, Utility Interruptions	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	Contra Costa Water District				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	Local Budgeted Funds, Private/Non-Profit Funds, HMGP, BRIC, FEMA PA		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (Staff Time), Property Owners Fee	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Seismic reinforcement of Reservoir 1 (2.5 MG water tank). Seismic mitigation measures would include thickening bottom courses to improve resistance to tensile and compressive stresses, adding new anchors around the reservoir perimeter, widening the ring wall to accommodate new anchors and additional seismic evaluations of the inlet/outlet pipe.				
Action Number	DWD-17	**Year Initiated / Anticipated Year of Initiation**	2026	**Prioritization Score**	30/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Earthquake, Wildfire	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Long Term		**Estimated Cost**	High	
Potential Funding Source	Local Budgeted Funds, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	District Funds (General Fund, Staff Time)	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

Mitigation Action	Install seismometer in the Reservoir 2 (5 MG storage tank) to measure and record the vibrations of the ground caused by seismic waves that could initiate alarms to protect the reservoir and retrofit the bottom course with steel bands. Reservoir 2 was constructed in 1988 and is not built to current American Water Works Association (AWWA) D100 (2011) standards. Seismic retrofitting the bottom course with steel bands to improve resistance to tensile and compressive stresses during a seismic event would mitigate this hazard and bring to AWWA standards.				
Action Number	DWD-18	**Year Initiated / Anticipated Year of Initiation**	2025	**Prioritization Score**	39/40
Goal(s) / Objective(s) Addressed		**Goals:** 1, 2, 3, 4, 5	**Hazard(s) Mitigated**	Earthquake, Wildfire	
Project Status		New	If *Deleted/No Longer Needed*, provide reason.	N/A	
Benefits *(Loss Avoided)*		High			
Lead Agency / Organization	Diablo Water District		**Supporting Agency / Organization** *(If applicable)*	N/A	
Additional Participating Jurisdictions *(If applicable)*	N/A				
Project Duration	Short Term		**Estimated Cost**	High	
Potential Funding Source	Local Budgeted Funds, State Special Fund, HMGP, BRIC		If *Other*, you **must** identify a funding source.	N/A	
			Please provide further detail on Potential Funding Source.	California State Water Resources Control Board (SWRCB) Fund	
Implementation Priority	High	**Integration Ideas** *(Optional)*			

APPENDIX A. HAZARD MAPS

The following hazards were mapped for the DWD – floods, landslides, and wildfires.

- **Figure 1** illustrates the District's service area within the Special Flood Hazard Area (SFHZ), including each Flood Zone, and the 500-year floodplain. Flood Insurance Rate Maps (FIRMs) show the flood zones, floodplain boundaries, and Base Floor Elevation (BFE) and are used for floodplain management, flood insurance ratings, and to determine flood insurance requirements. FIRMs show areas with a 1% chance of flooding each year, commonly known as the 100-year floodplains, and are illustrated as the SFHA.[11] The 500-year floodplains show areas with a 0.2% chance of flooding each year.
- **Figure 2** illustrates landslide susceptibility within the District's service area. Landslide susceptibility maps describe the relative likelihood of future land sliding based solely on the intrinsic properties of a location or site. There are three (3) site factors that most determine susceptibility – prior failure, rock or soil strength, and steepness of slope.[12]
- **Figure 3** illustrates the California Fire Hazard Severity Zones (FHSZ) in the State Responsibility Area (SRA) within the District's service area.

[11] Federal Emergency Management Agency. (2017). Flood Insurance Study: Contra Costa County, California and Incorporated Areas. Retrieved from https://www.contracosta.ca.gov/DocumentCenter/View/77626/Volumes-I-V?bidId=.
[12] California Department of Conservation. (n.d.). Landslides. Retrieved from https://www.conservation.ca.gov/cgs/landslides.

Figure 1. Special Flood Hazard Area

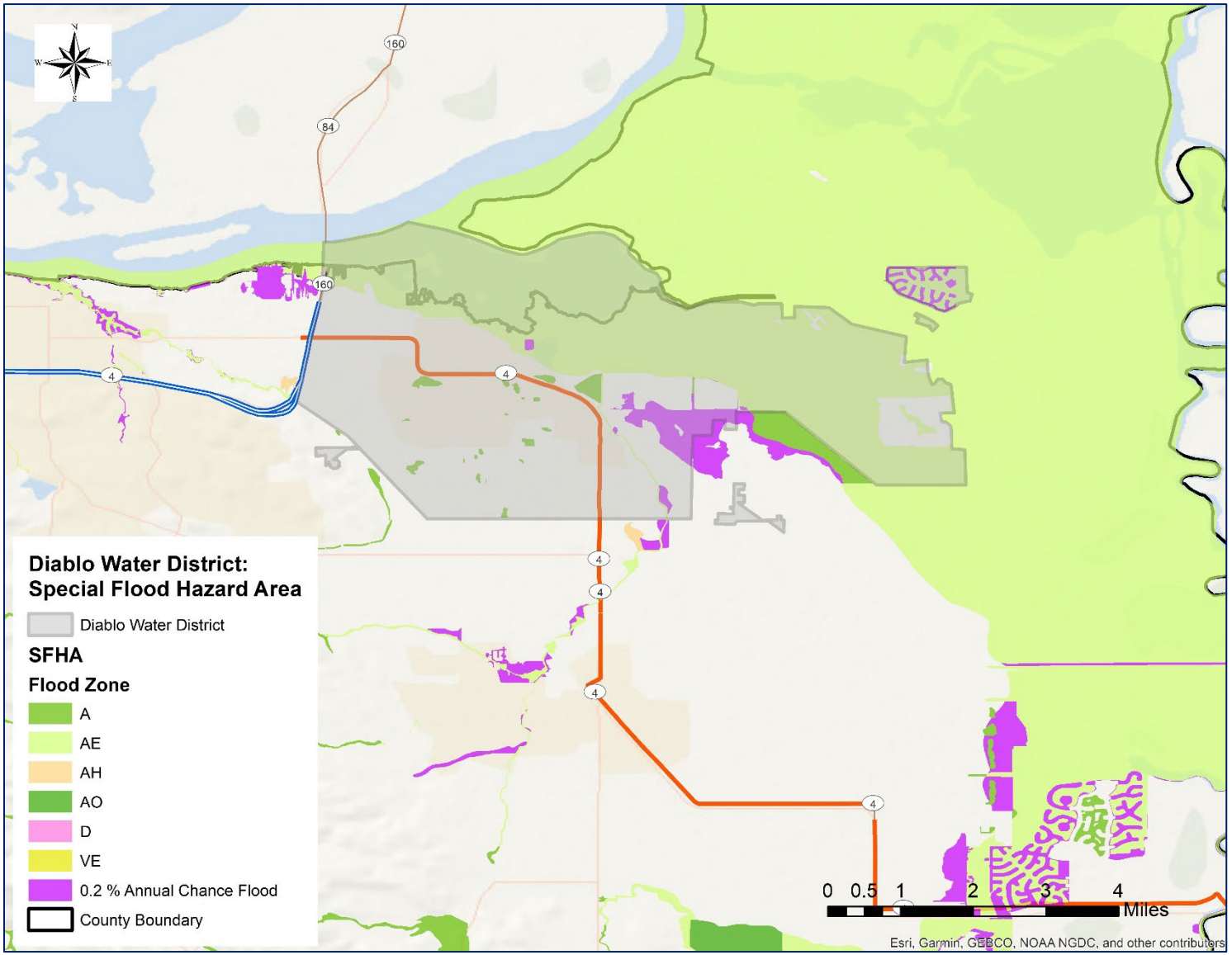


Figure 2. Landslide Susceptibility

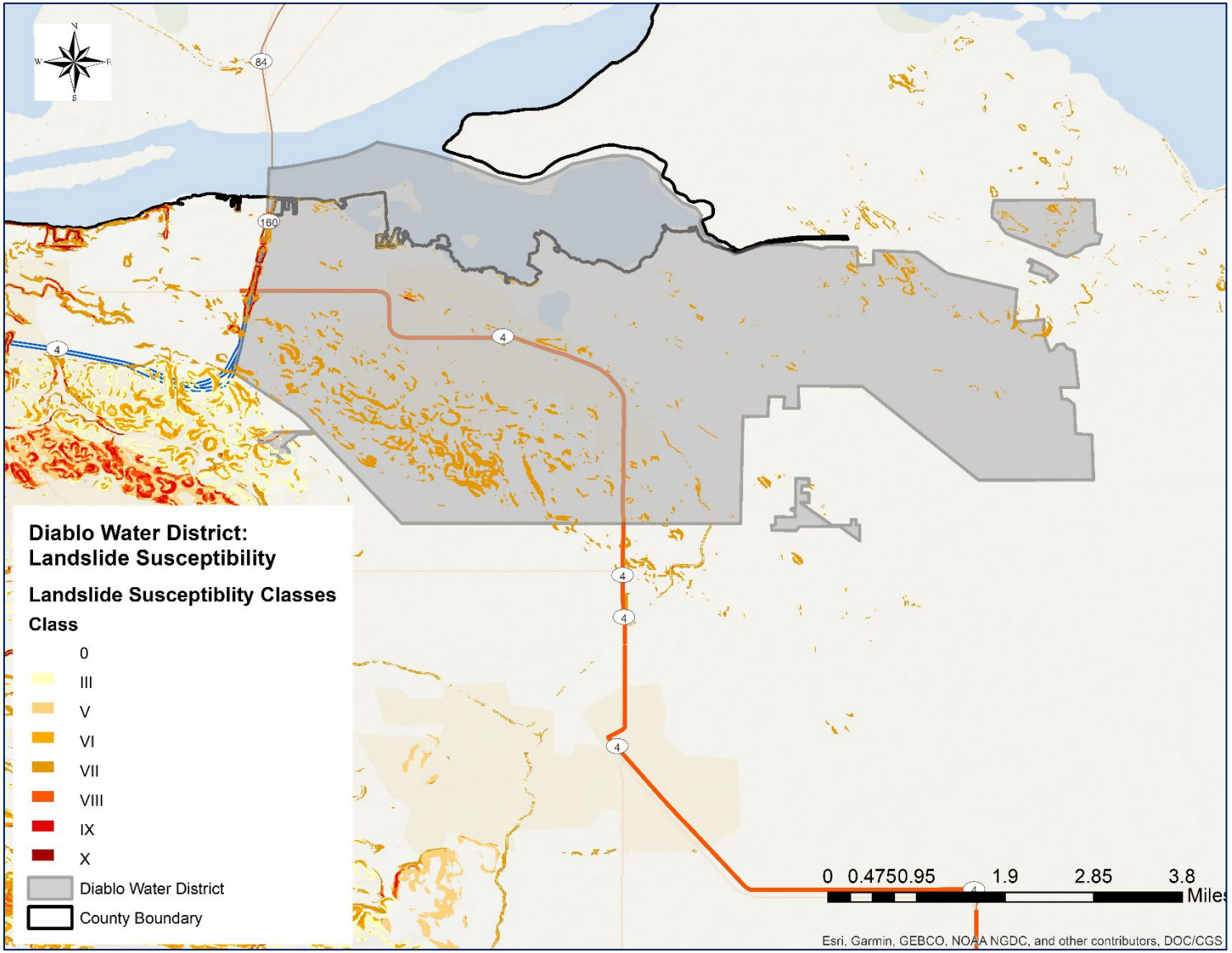
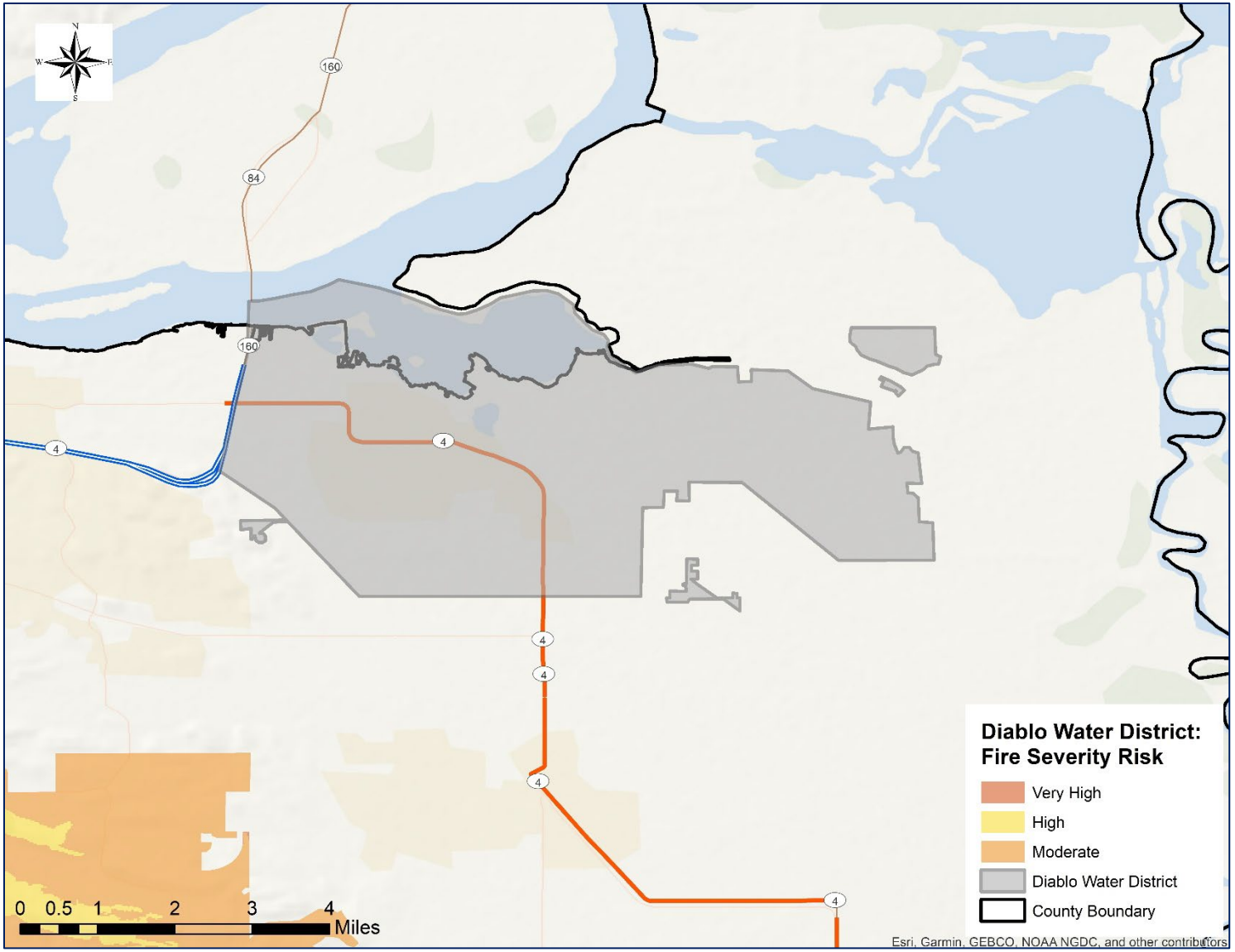


Figure 3. Fire Hazard Severity Zones



APPENDIX B. STAKEHOLDER AND PUBLIC ENGAGEMENT

The mitigation planning process promotes awareness of hazard risks and continues the conversation about the community's safety and resilience. A hazard mitigation plan generates additional community support when it accurately reflects the values and priorities of the community which will lead to successfully implementing the mitigation actions and projects identified in this Plan.

Federal regulations for mitigation plan approval require that stakeholders and the general public are given opportunities to be involved in the plan's development and update process. Input from community members can strengthen the content and outcomes of the hazard mitigation plan. Furthermore, the Plan must state continued public engagement as the Plan is carried out during its lifetime. A public outreach strategy outlines what the community intends to achieve throughout the outreach efforts. Additionally, it identifies who to involve in the process, and how and when to effectively engage the community. Contra Costa County and DWD worked together to ensure that the stakeholder and public engagement was meaningful and productive. Refer to **Volume 1 (Planning Area-wide Elements)** for further information on how stakeholders and the general public were given opportunities to be involved throughout the planning process. However, every plan participant employed a slightly tailored engagement strategy that suits the community's demographics, including the underserved population, and needs in addition to the lead jurisdiction's engagement strategy.

DWD stakeholders and the public were given a number of opportunities to be involved throughout the planning process. Opportunities were provided via a public survey, in person and virtual public meetings, and public engagement activities to review the Plan draft (i.e., public comment period). The public meetings allowed the County to introduce the Plan update, identify additional hazards of concern that should be included, if any, and to provide input for the various mitigation measures intended to eliminate or reduce the negative impact to those hazards. Language translation assistance in Spanish was available in all public meetings. The public survey asked community representatives and members of the public to rate each of the hazards in terms of perceived risk. Furthermore, they were asked to rate "mitigation importance" for each of the identified hazards in the Plan. The information gathered from this survey was used to inform the hazard risk prioritization process, and to ensure the Plan adequately addressed the public's concerns and priorities. The survey was available in English, Spanish, Tagalog, Traditional Chinese, and Simplified Chinese. Approximately, 145 respondents that lived within the District and 29 that worked within the District participated in the survey. Please refer to **Volume 1 (Planning Area-wide Elements)** for further information and supporting documentation of the public meetings and public survey.

How Public Input was Incorporated into the Plan

Information and feedback gained through the public survey, public meetings, and public comment period provided valuable data to validate and confirm the risk assessment findings and potential mitigation strategies. Specifically, feedback from the public offered during the public meetings offered greater insights into the public's concerns regarding specific hazards and their impacts. The public also offered specific initiatives they felt would create greater resiliency for the District and its residents.

Survey results helped validate the hazards included in the Plan, the hazard ranking process, and areas where the County and jurisdictions could further improve outreach and education efforts. Open-ended responses, specifically regarding their experience with damages from past hazards, helped to validate hazard-specific impact data in *Chapter 4 (Hazard Identification and Risk Assessment)* of **Volume 1 (Planning Area-wide Elements)**. These, and related findings, helped the County and District Core Planning Teams determine meaningful mitigation projects.

After the public comment period ended, no public feedback was received for the DWD Annex. However, in order to keep the Plan current after it is approved, the District will ensure that the public continues to be involved in the Plan and how it is carried out. Refer to Section B.2 of this Annex for further details on continued public engagement.

B.1. Public Comment Period

Once the draft Plan was completed, the public was given an opportunity to review and provide comments on the County Hazard Mitigation Plan, including DWD's Annex, prior to submitting the Plan to the State and FEMA. The countywide public comment period began on April 22, 2024, and went on through May 31, 2024. Prior to the public comment period, the Contra Costa County Core Planning Team conducted a strategy meeting with all plan participants (i.e., DWD) that served as a brainstorming session and helped determine the public outreach goals and proper outreach methods for the public comment period. Subsequently, the DWD Core Planning Team developed a public outreach strategy that meets the District's unique needs of the community to engage stakeholders and the public during the public comment period. The District ensured equitable outreach by targeting Contra Costa County's vulnerable communities, including the younger (under 18 years old) and elderly (over 65 years old) population, individuals with limited English proficiency, and those with access and functional needs.

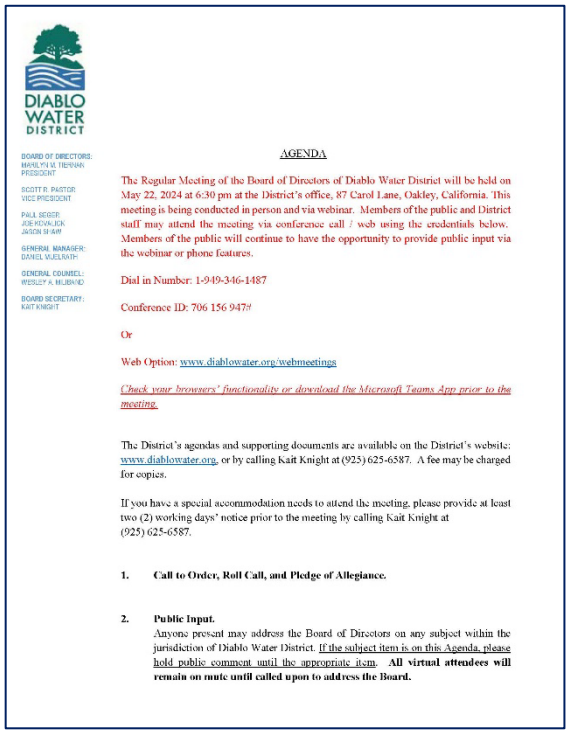
The DWD Local Planning Team coordinated with its stakeholders to ensure that the public had an opportunity to learn about the Plan, mitigation actions planned for their community, and ways to get involved in the planning process. Outreach to the community within the District involved a combination of in person and digital media starting on April 22, 2024, through the end of the public comment period on May 31, 2024. To ensure equitable outreach a calendar was created to strategize and map all events.

Public Comment Outreach Calendar

May 2024	
Date	**Wednesday, May 22nd**
Event Name	Board of Directors of Diablo Water District Meeting
Location	Diablo Water District Office 87 Carol Lane Oakley, CA 94561
Outreach Method	Presentation to Governing Body
Outreach Purpose	Inform, Involve
Targeted Population	Districtwide, Access and Functional Needs
Accommodations Provided	After Hours, Virtual Option

May 22, 2024 – Board of Directors of Diablo Water District Meeting

The Board of Directors Meeting was held in person with a virtual option, after hours (6:30 PM) on a weekday. District staff were able to discuss the Contra Costa County Hazard Mitigation Plan, including the District's Annex, the local hazards discussed in the Plan, and opportunities the public had to review and provide feedback on the Plan. All Board of Directors meetings are open to the general public.



DIABLO WATER DISTRICT

BOARD OF DIRECTORS:
MARILYN M. TIERNAN, PRESIDENT
SCOTT R. PASTOR, VICE PRESIDENT
PAUL SEGER
JOE HOVLAND
JASON SHAW
GENERAL MANAGER: DANIEL MUELRATH
GENERAL COUNSEL: WESLEY A. MILIBAND
BOARD SECRETARY: KAIT KNIGHT

AGENDA

The Regular Meeting of the Board of Directors of Diablo Water District will be held on May 22, 2024 at 6:30 pm at the District's office, 87 Carol Lane, Oakley, California. This meeting is being conducted in person and via webinar. Members of the public and District staff may attend the meeting via conference call / web using the credentials below. Members of the public will continue to have the opportunity to provide public input via the webinar or phone features.

Dial in Number: 1-949-346-1487

Conference ID: 706 156 947#

Or

Web Option: www.diablowater.org/webmeetings

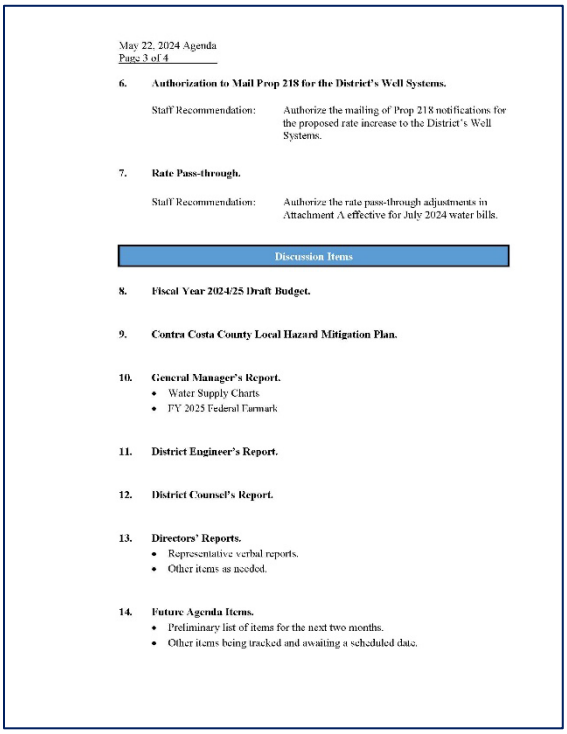
Check your browsers' functionality or download the Microsoft Teams App prior to the meeting.

The District's agendas and supporting documents are available on the District's website: www.diablowater.org, or by calling Kait Knight at (925) 625-6587. A fee may be charged for copies.

If you have a special accommodation needs to attend the meeting, please provide at least two (2) working days' notice prior to the meeting by calling Kait Knight at (925) 625-6587.

1. **Call to Order, Roll Call, and Pledge of Allegiance.**

2. **Public Input.**
Anyone present may address the Board of Directors on any subject within the jurisdiction of Diablo Water District. If the subject item is on this Agenda, please hold public comment until the appropriate item. **All virtual attendees will remain on mute until called upon to address the Board.**



May 22, 2024 Agenda
Page 3 of 4

6. **Authorization to Mail Prop 218 for the District's Well Systems.**
Staff Recommendation: Authorize the mailing of Prop 218 notifications for the proposed rate increase to the District's Well Systems.

7. **Rate Pass-through.**
Staff Recommendation: Authorize the rate pass-through adjustments in Attachment A effective for July 2024 water bills.

Discussion Items

8. **Fiscal Year 2024/25 Draft Budget.**

9. **Contra Costa County Local Hazard Mitigation Plan.**

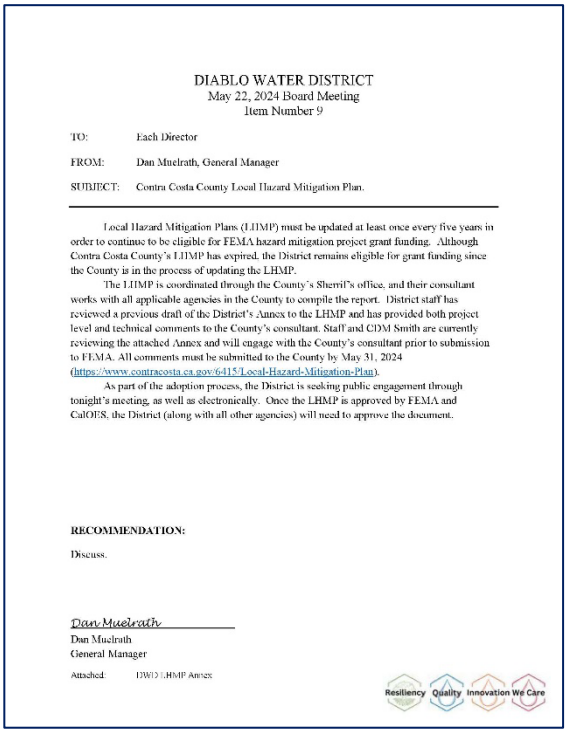
10. **General Manager's Report.**
- Water Supply Charts
- FY 2025 Federal Earmark

11. **District Engineer's Report.**

12. **District Counsel's Report.**

13. **Directors' Reports.**
- Representative verbal reports.
- Other items as needed.

14. **Future Agenda Items.**
- Preliminary list of items for the next two months.
- Other items being tracked and awaiting a scheduled date.



DIABLO WATER DISTRICT
May 22, 2024 Board Meeting
Item Number 9

TO: Each Director

FROM: Dan Muelrath, General Manager

SUBJECT: Contra Costa County Local Hazard Mitigation Plan.

Local Hazard Mitigation Plans (LHMP) must be updated at least once every five years in order to continue to be eligible for FEMA hazard mitigation project grant funding. Although Contra Costa County's LHMP has expired, the District remains eligible for grant funding since the County is in the process of updating the LHMP.

The LHMP is coordinated through the County's Sherriff's office, and their consultant works with all applicable agencies in the County to compile the report. District staff has reviewed a previous draft of the District's Annex to the LHMP and has provided both project level and technical comments to the County's consultant. Staff and CDM Smith are currently reviewing the attached Annex and will engage with the County's consultant prior to submission to FEMA. All comments must be submitted to the County by May 31, 2024 (https://www.contracosta.ca.gov/6415/Local-Hazard-Mitigation-Plan).

As part of the adoption process, the District is seeking public engagement through tonight's meeting, as well as electronically. Once the LHMP is approved by FEMA and CalOES, the District (along with all other agencies) will need to approve the document.

RECOMMENDATION:

Discuss.

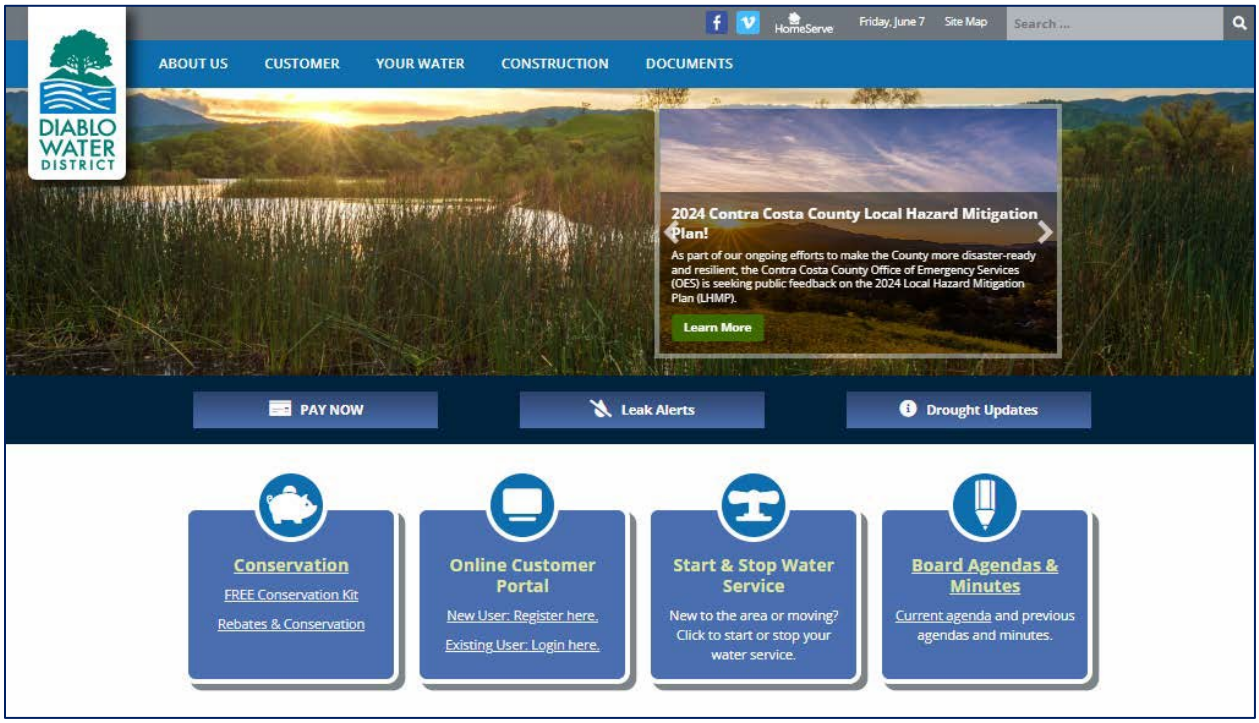
Dan Muelrath
Dan Muelrath
General Manager

Attached: DWD LHMP Annex

Resiliency Quality Innovation We Care

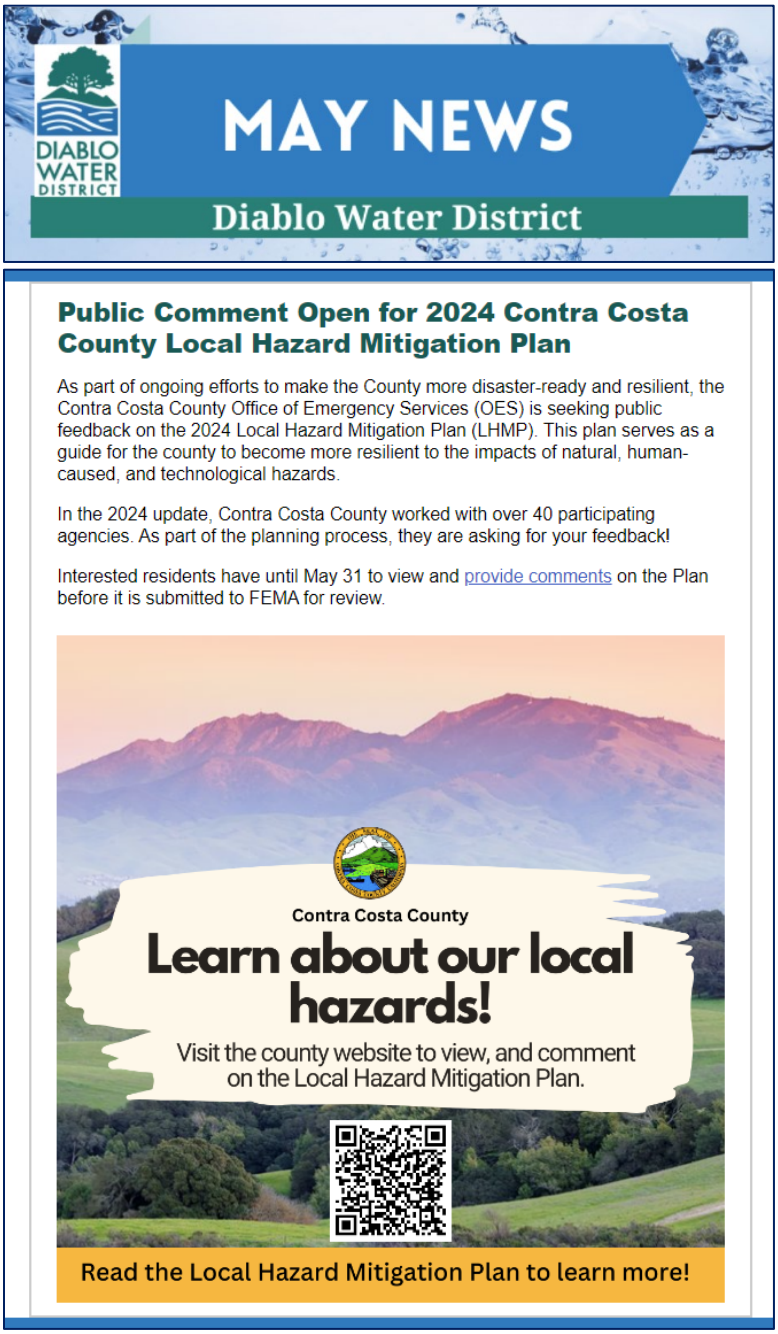
District Website

Information on the Contra Costa County Hazard Mitigation Plan and the DWD Annex, and announcements providing opportunity to comment were posted to the District's website. The website served as a central place which allowed all residents, stakeholders, and partners within the District to review and provide feedback on the Plan, and thus promoted more public comment.



Diablo Water District E-Newsletter

The District issues a monthly e-newsletter to share the latest community news with customers that subscribe. The May 2024 edition included information on the Contra Costa County Hazard Mitigation Plan and District Annex and advocated for residents to review the Plan and provide feedback. The announcement included a QR code and link that guided the reader to view the Plan and the feedback form. Customers that receive the e-newsletter include senior facilities, mobile home parks, schools, preschools, daycares, and apartment complexes. The May 2024 edition can be accessed via the following link: https://myemail-api.constantcontact.com/Diablo-Water-District-May-Update.html?soid=1135372191116&aid=-U5Cs9GPK9o.



Stakeholder Engagement

Due to the size of the Plan (the Base Plan and 40 annexes), some stakeholders would receive the same invitation a significant amount of times. For a more productive outreach and to avoid overwhelming stakeholders, Contra Costa County sent a single invitation to all the countywide stakeholders via e-mail. However, each plan participant was required to cross-reference the countywide list and identify the stakeholders that applied specifically to their jurisdiction. Not only did this help ensure that a comprehensive list was compiled as part of the stakeholder engagement, but it assisted each plan participant identify any additional stakeholders that may have not been on the list. **Table 22** outlines the stakeholders DWD identified and provided an opportunity to review and provide feedback on the draft Plan and Annex, via the countywide stakeholders e-mail.

Table 22. Diablo Water District Specific Stakeholders List

Local and Regional Agencies	
Contra Costa County Department of Public Works	Tri Delta Transit
East Bay Regional Park District	Contra Costa Water District
Agencies that have the Authority to Regulate Development	
Contra Costa Local Agency Formation Commission	
Neighboring Communities	
Byron-Bethany Irrigation District	City of Oakley
City of Antioch	City of Pittsburg
City of Brentwood	Ironhouse Sanitary District
Nonprofit Organizations	
American Red Cross	Meals on Wheels
California Resiliency Alliance	Society of St. Vincent de Paul of Contra Costa County
Community Awareness and Emergency Response	United Way Bay Area
Loaves and Fished – Contra Costa County	
Businesses, Academia, and Other Private Organizations	
Amtrak	Kaiser Permanente Hospital
BNSF Railway	Pacific Gas & Electric
John Muir Behavioral Health	

Refer to **Volume 1 (Planning Area-wide Elements)** for a full list of the countywide stakeholders.

B.2. Continued Public Engagement

To ensure continued public engagement, Contra Costa County and DWD will ensure the Plan is available in the County's Hazard Mitigation Plan webpage after it has been approved to allow the public an opportunity to provide continual feedback and input. As future needs and concerns arise, or if the public would like to provide feedback regarding the latest version of the Plan and the District's Annex, the public is invited to use the comment form, which is provided on the website, to provide comments.

County Hazard Mitigation Webpage: contracosta.ca.gov/6415/Local-Hazard-Mitigation-Plan

Comment Form: survey.alchemer.com/s3/7792090/CommentFormContraCostaCountyHMP.

DWD will continue to work with Contra Costa County and stakeholders to ensure that the public has an opportunity to learn about the Plan, mitigation actions planned for their communities, and ways to get involved. Hazard mitigation will be a part of the District's community outreach strategy to include, but not limited to, public meetings, community events, social media, and public surveys throughout the year. Furthermore, Diablo Water District will continue to ensure equitable outreach by working with other departments, non-profits, and agencies that work with underserved communities throughout the County.

APPENDIX C. HAZARD RISK ASSESSMENT METHODOLOGY

As part of the Contra Costa County Office of Emergency Services (OES), the risk assessment identifies the natural, human-caused, and technological hazards that have potential impacts on all or portions of the County. Hazard identification, historical occurrences, and risk modeling (where applicable and available for specific hazards) information was collected from multiple sources including, but not limited to:

- Environmental Systems Research Institute (Esri)
- Federal Emergency Management Agency (FEMA)
- National Centers for Environmental Information (NCEI)
- National Weather Services (NWS)
- United States Geological Survey (USGS)
- Local repositories

This information was analyzed to assess the risk and vulnerability of people, property, the environment, and the jurisdiction's essential operations from these hazards. Furthermore, a risk ranking was performed for the hazards of concern described in this Plan. The risk ranking is an important step in developing an action plan, as it allows jurisdictions to compare the risk factors from one hazard to another. That comparison provides critical information to use in selecting hazard mitigation actions and their priorities. This process is not only intended to help focus actions on the hazards with the highest ranking, but also to ensure that jurisdictions are aware of the hazards that ranked low yet still pose significant risk.

In order to provide an informed and comprehensive ranking of the hazards addressed in this Plan, a number of factors were considered: probability, extent, vulnerability, and impact. The sum of all the weighted factors for the extent, vulnerability, and impact categories was combined into a final consequence score. Probability multiplied by consequence resulted in a total risk score for each hazard.

Extent + Vulnerability + Impact = Consequence

Consequence x Probability = Total Risk Score

These results were determined by following a data driven quantitative assessment, reviewing, and ranking local knowledge from local subject matter experts, and developing other risk elements by the Core Planning Team based on the data collected. These elements were then aggregated to inform the analysis.

At the fundamental level, consequence is an assessment of the potential impact(s) if the hazard incident actually occurs. In this assessment, the consequence of an event (or the impact) will be interdependent on the following factors:

- Vulnerabilities (i.e., social, physical, and community conditions)
- Capabilities and capacities
- Mitigation

- Characteristics of the hazard event (i.e., magnitude, scale)

The frequency/probability of the hazard is not included in assessing the consequence because without the event, there is no consequence or impact.

C.1. Probability of Occurrence

The probability of occurrence of a hazard is indicated by a probability factor based on the likelihood of annual occurrence. Numerical probability factors were assigned as follows.

Table 23 outlines the probability of occurrence factors used in the risk assessment calculations for this Plan. A significant hazard event is defined as any hazard occurrence that directly or indirectly damages structures or infrastructure, impedes normal business operations, and/or is likely to cause serious or fatal injuries.

Table 23. Probability of Occurrence

Probability	Description	Probability Factor
High	Significant hazard event is likely to occur annually.	3
Medium	Significant hazard event is likely to occur within 25 years.	2
Low	Significant hazard event is likely to occur within 100 years.	1
Unlikely	There is little to no probability of significant occurrence, or the recurrence interval is greater than every 100 years.	0

The assessment of hazard frequency is generally based on past hazard events in the area and professional judgment of local subject matter experts.

C.2. Extent Factors

Extent was assessed in two (2) categories – extent/intensity potential and catastrophic probability of the hazard. Numerical extent factors were assigned as follows.

C.2.1. Extent/Intensity Factor

Extent is defined as the range of anticipated intensities of the identified hazards. This category is most commonly expressed using various scientific scales (e.g., Saffir-Simpson, Enhanced Fujita, Modified Mercalli). Extent/Intensity Factors are hazard-specific and are detailed in each hazard profile. **Table 24** outlines the extent/intensity factors used in the risk assessment calculations for this Plan.

Table 24. Extent/Intensity Factor

Probability	Description	Extent Factor
High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3
Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2
Low	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a low-intensity incident.	1
Unlikely	Historical and/or probabilistic models/studies for this hazard indicate the possibility of little to no intensity.	0

C.2.2. Catastrophic Factor

The probability that a hazard could be catastrophic. Catastrophes are defined as significant incidents that cause sudden and great harm or destruction. **Table 25** outlines the catastrophic factors used in the risk assessment calculations for this Plan.

Table 25. Catastrophic Factor

Probability	Description	Extent Factor
High	Catastrophic hazard event is likely to occur at least once in 10 years.	3
Medium	Catastrophic hazard event is likely to occur at least once between 11 and 50 years.	2
Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1
No Impact	Virtually no probability that this hazard could be catastrophic.	0

Each category was assigned a weighting factor to reflect its significance, consistent with this typically used for measuring the benefits of hazard mitigation actions – a weighting factor of three (3) was assigned for *Extent/Intensity* and its potential for *Catastrophe*.

C.3. Vulnerability Factors

Vulnerabilities were assessed in three (3) categories – population exposure, property exposure, and exposure based on changes in development. Numerical vulnerability factors were assigned as follows.

C.3.1. Population Exposure Factor

Population exposure values were assigned based on the percentage of the total population exposed to the hazard event. **Table 26** outlines the population exposure factors used in the risk assessment calculations for this Plan.

Table 26. Population Exposure Factor

Probability	Description	Vulnerability Factor
High	30% or more of the population is exposed to the hazard.	3
Medium	15% to 29% of the population is exposed to the hazard.	2
Low	14% or less of the population is exposed to the hazard.	1
No Vulnerability	None of the population is exposed to the hazard.	0

C.3.2. Property Exposure Factor

Property exposure values were assigned based on the percentage of the total property value exposed to the hazard event. **Table 27** outlines the property exposure factors used in the risk assessment calculations for this Plan.

Table 27. Property Exposure Factor

Probability	Description	Vulnerability Factor
High	25% or more of the total assessed property value is exposed to the hazard.	3
Medium	10% to 24% of the total assessed property value is exposed to a hazard.	2
Low	9% or less of the total assessed property value is exposed to a hazard.	1
No Vulnerability	None of the total assessed property value is exposed to a hazard.	0

C.3.3. Changes in Development

Changes in development in the past five (5) years have increased or decreased the community's vulnerability/exposure to the hazard. **Table 28** outlines the changes in development factors used in the risk assessment calculations for this Plan.

Table 28. Changes in Development Factor

Probability	Description	Vulnerability Factor
High	Changes in development have increased the vulnerability/exposure of the community to the hazard by 10% or more.	3
Medium	Changes in development have increased the vulnerability/exposure of the community to the hazard between 5% and 9%.	2
Low	Changes in development have increased the vulnerability/exposure of the community to the hazard by 4% or less.	1
No Vulnerability	Changes in development had no effect and/or have decreased the vulnerability/exposure of the community to the hazard.	0

Each category was assigned a weighting factor to reflect the significance, consistent with those typically used for measuring the benefits of hazard mitigation actions – a weighting factor of three (3) was assigned for *Population Exposure*, and a weighting factor of one (1) was assigned for *Property Exposed* and *Changes in Development*.

C.4. Impact Factors

Hazard impacts were assessed in eight (8) categories – population and life/safety, underserved/equity, property damages, economic, environmental, essential operations, future development, and climate change. Numerical impact factors were assigned as follows.

C.4.1. Population and Life Safety Factor

Population and life safety values were assigned based on the best available data (historical and probabilistic) for people vulnerable to the hazard event and whether the affected population is likely to experience adverse impacts from the hazard incident. **Table 29** outlines the population and life safety factors used in the risk assessment calculations for this Plan.

Table 29. Population and Life Safety Factor

Probability	Description	Impact Factor
High	Populations exposed to this hazard are likely to experience significant adverse impacts, such as fatalities and severe injuries.	3
Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2
Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1
No Impact	Populations exposed to this hazard are not likely to experience significant adverse impacts.	0

C.4.2. Underserved/Equity Factor

Underserved/equity values were assigned based on the best available data for underserved populations vulnerable to the hazard event and whether the affected population is likely to experience adverse/disproportionate impacts from the hazard incident resulting in greater disparity in equity. **Table 30** outlines the underserved/equity factors used in the risk assessment calculations for this Plan.

Table 30. Underserved/Equity Factor

Probability	Description	Impact Factor
High	Underserved populations exposed to the hazard are likely to experience significant adverse/disproportionate impacts, such as fatalities and severe injuries.	3
Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2
Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1
No Impact	Underserved populations exposed to the hazard are not likely to experience significant adverse/disproportionate impacts.	0

C.4.3. Property Damage Factor

Property damage values were assigned based on the expected total property damage incurred from a hazard incident. It is important to note that values represent estimates of the loss from a major incident based on historical data or probabilistic models/studies. **Table 31** outlines the property damage factors used in the risk assessment calculations for this Plan.

Table 31. Property Damage Factor

Probability	Description	Impact Factor
High	More than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to 15% or more of the property value within the jurisdiction.	3
Medium	More than $500,000 but less than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to more than 5% but less than 15% of the property value within the jurisdiction.	2

Probability	Description	Impact Factor
Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1
No Impact	Little to no property damage is expected from a single major hazard event.	0

C.4.4. Economic Factor

An estimation of the impact, expressed in terms of dollars, on the local economy is based on a loss of business revenue, crops, worker wages, and local tax revenues or on the impact on the local gross domestic product (GDP). **Table 32** outlines the economic factors used in the risk assessment calculations for this Plan.

Table 32. Economic Factor

Probability	Description	Impact Factor
High	Where the total economic impact is likely to be greater than $10 Million.	3
Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2
Low	Total economic impact is not likely to be greater than $100,000.	1
No Impact	Virtually no significant economic impact.	0

C.4.5. Environmental Factor

An estimate of the environmental impact from a major hazard event requiring outside resources and support; and/or repair, clean-up, restoration, and/or preservation work. **Table 33** outlines the environmental factors used in the risk assessment calculations for this Plan.

Table 33. Environmental Factor

Probability	Description	Impact Factor
High	Environmental impact from a single major hazard event is likely to be significant, requiring extensive outside resources and support; and/or repair, clean-up, restoration, and/or preservation work.	3
Medium	Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work.	2
Low	Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support, and/or minimal repair, clean-up, restoration, or preservation work.	1
No Impact	No environmental impacts from a single major hazard event are likely.	0

C.4.6. Essential Operations Factors

The essential operations factor is the impact on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community after a single major hazard event. **Table 34** outlines the essential operations factors used in the risk assessment calculations for this Plan.

Table 34. Essential Operations Factor

Probability	Description	Impact Factor
High	Impact greater than 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	3
Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2
Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1
No Impact	No impact on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	0

C.4.7. Future Development Factor

The future development factor is the potential that future development will have on increasing or decreasing the impact/consequence of the hazard. **Table 35** outlines the future development factors used in the risk assessment calculations for this Plan.

Table 35. Future Development Factor

Probability	Description	Impact Factor
High	Future development trends will significantly increase the impact/consequence of this hazard.	3
Medium	Future development trends will increase the impact/consequence of this hazard, but not significantly.	2
Low	Future development trends will minimally increase impact/consequence of this hazard.	1
No Impact	Future development trends will not increase the impact/consequence of the hazard, and/or may even decrease the impact/consequence of this hazard.	0

C.4.8. Climate Change Factor

The potential that climate change will increase the risk of the hazard (i.e., type, location, and range of anticipated intensities of the hazard and impacts). **Table 36** outlines the climate change factors used in the risk assessment calculations for this Plan.

Table 36. Climate Change Factor

Probability	Description	Impact Factor
High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3
Medium	Climate Change trends will increase the risk of this hazard and its impacts, but not significantly.	2
Low	Climate Change trends will minimally increase the risk of this hazard and its impacts.	1
No Impact	Climate change trends will not increase the risk of the hazard and its impacts.	0

Each category was assigned a weighting factor to reflect its significance, consistent with those typically used for measuring the benefits of hazard mitigation actions – a weighting factor of three (3) was assigned for *Population and Life Safety*, and *Underserved/Equity*, and a weighting factor of two (2) was assigned for *Property Damage*. A weighting factor of one (1) was assigned for *Economic*, *Environmental*, *Essential Operations, Future Development*, and *Climate Change*.

APPENDIX D. HAZARD RISK RANKING DETAILS

D.1. Probability of Occurrence

Hazard Event	Probability of Occurrence		Probability Factor	Weighted Factor
Climate Change	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Dam and Levee Failure	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Drought	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Earthquake	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Flood (Riverine/Creek)	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Flood (Urban/Flash Flood)	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Heat Wave/Extreme Heat *(Severe Weather)*	High	Significant hazard event is likely to occur annually.	3	N/A
Heavy Rainfall *(Severe Weather)*	High	Significant hazard event is likely to occur annually.	3	N/A
Landslide	Low	Significant hazard event is likely to occur within 100 years.	1	N/A
Sea Level Rise	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Severe Thunderstorm *(Severe Weather)*	High	Significant hazard event is likely to occur annually.	3	N/A
Strong Winds/ Damaging Winds *(Severe Weather)*	High	Significant hazard event is likely to occur annually.	3	N/A
Tornado *(Severe Weather)*	Low	Significant hazard event is likely to occur within 100 years.	1	N/A
Tsunami	Low	Significant hazard event is likely to occur within 100 years.	1	N/A
Wildfire	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Active Shooter Incidents	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Cybersecurity Threats	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A
Hazardous Materials Incidents	Medium	Significant hazard event is likely to occur within 25 years.	2	N/A

Hazard Event	Probability of Occurrence		Probability Factor	Weighted Factor
Terrorism (Weapons of Mass Destruction)	Low	Significant hazard event is likely to occur within 100 years.	1	N/A
Utility Interruptions	High	Significant hazard event is likely to occur annually.	3	N/A

D.2. Extent Factors

Hazard Event	Extent Factor	Extent		Extent Factor	Weighted Factor
Climate Change	***Extent/Intensity***	Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2	6
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3
Dam and Levee Failure	***Extent/Intensity***	High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3	9
	Catastrophic	High	Catastrophic hazard event is likely to occur at least once in 10 years.	3	9
Drought	***Extent/Intensity***	High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3	9
	Catastrophic	High	Catastrophic hazard event is likely to occur at least once in 10 years.	3	9
Earthquake	***Extent/Intensity***	High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3	9
	Catastrophic	High	Catastrophic hazard event is likely to occur at least once in 10 years.	3	9
Flood (Riverine/Creek)	***Extent/Intensity***	High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3	9
	Catastrophic	High	Catastrophic hazard event is likely to occur at least once in 10 years.	3	9
Flood (Urban/Flash Flood)	***Extent/Intensity***	High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3	9
	Catastrophic	Medium	Catastrophic hazard event is likely to occur at least once between 11 and 50 years.	2	6

Hazard Event	Extent Factor	Extent		Extent Factor	Weighted Factor
Heat Wave/Extreme Heat *(Severe Weather)*	***Extent/Intensity***	Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2	6
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3
Heavy Rainfall *(Severe Weather)*	***Extent/Intensity***	Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2	6
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3
Landslide	***Extent/Intensity***	Low	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a low-intensity incident.	1	3
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3
Sea Level Rise	***Extent/Intensity***	Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2	6
	Catastrophic	Medium	Catastrophic hazard event is likely to occur at least once between 11 and 50 years.	2	6
Severe Thunderstorm *(Severe Weather)*	***Extent/Intensity***	Low	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a low-intensity incident.	1	3
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3
Strong Winds/ Damaging Winds *(Severe Weather)*	***Extent/Intensity***	Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2	6
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3
Tornado *(Severe Weather)*	***Extent/Intensity***	Low	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a low-intensity incident.	1	3
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3
Tsunami	***Extent/Intensity***	Low	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a low-intensity incident.	1	3
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3

Hazard Event	Extent Factor	Extent		Extent Factor	Weighted Factor
Wildfire	***Extent/Intensity***	High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3	9
	Catastrophic	Medium	Catastrophic hazard event is likely to occur at least once between 11 and 50 years.	2	6
Active Shooter Incidents	***Extent/Intensity***	Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2	6
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3
Cybersecurity Threats	***Extent/Intensity***	Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2	6
	Catastrophic	Medium	Catastrophic hazard event is likely to occur at least once between 11 and 50 years.	2	6
Hazardous Materials Incidents	***Extent/Intensity***	High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3	9
	Catastrophic	Medium	Catastrophic hazard event is likely to occur at least once between 11 and 50 years.	2	6
Terrorism (Weapons of Mass Destruction)	***Extent/Intensity***	High	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a high-intensity incident.	3	9
	Catastrophic	High	Catastrophic hazard event is likely to occur at least once in 10 years.	3	9
Utility Interruptions	***Extent/Intensity***	Medium	Historical and/or probabilistic models/studies for this hazard indicate the possibility of a medium-intensity incident.	2	6
	Catastrophic	Low	Catastrophic hazard event is likely to occur at least once in 51 or more years.	1	3

D.3. Vulnerability Factors

Hazard Event	Vulnerability Factor	Vulnerability		Vulnerability Factor	Weighted Factor
Climate Change	***Population Exposure***	High	30% or more of the population (including underserved population) is exposed to the hazard.	3	9
	Property Exposure	Low	9% or less of the total assessed property value is exposed to the hazard.	1	2

Hazard Event	Vulnerability Factor	Vulnerability		Vulnerability Factor	Weighted Factor
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Dam and Levee Failure	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	Medium	10% to 24% of the total assessed property value is exposed to the hazard.	2	4
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Drought	***Population Exposure***	High	30% or more of the population (including underserved population) is exposed to the hazard.	3	9
	Property Exposure	Low	9% or less of the total assessed property value is exposed to the hazard.	1	2
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Earthquake	***Population Exposure***	High	30% or more of the population (including underserved population) is exposed to the hazard.	3	9
	Property Exposure	High	25% of the total assessed property is exposed to the hazard.	3	6
	Changes in Development	Medium	The changes in development have increased the vulnerability of the community to the hazard between 5% and 9%.	2	2
Flood (Riverine/Creek)	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	Medium	10% to 24% of the total assessed property value is exposed to the hazard.	2	4
	Changes in Development	Medium	The changes in development have increased the vulnerability of the community to the hazard between 5% and 9%.	2	2
Flood (Urban/Flash Flood)	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	Medium	10% to 24% of the total assessed property value is exposed to the hazard.	2	4
	Changes in Development	Medium	The changes in development have increased the vulnerability of the community to the hazard between 5% and 9%.	2	2
Heat Wave/Extreme Heat *(Severe Weather)*	***Population Exposure***	High	30% or more of the population (including underserved population) is exposed to the hazard.	3	9

Hazard Event	Vulnerability Factor	Vulnerability		Vulnerability Factor	Weighted Factor
	Property Exposure	No Vulnerability	None of the total assessed property value is exposed to the hazard.	0	0
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Heavy Rainfall *(Severe Weather)*	***Population Exposure***	High	30% or more of the population (including underserved population) is exposed to the hazard.	3	9
	Property Exposure	Medium	10 to 14% of the total assessed property is exposed to the hazard.	2	4
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Landslide	***Population Exposure***	Low	14% or less of the population (including underserved population) is exposed to the hazard.	1	3
	Property Exposure	Low	9% or less of the total assessed property value is exposed to the hazard.	1	2
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Sea Level Rise	***Population Exposure***	Low	15% to 29% of the population (including underserved population) is exposed to the hazard.	1	3
	Property Exposure	Low	10% to 24% of the total assessed property value is exposed to the hazard.	1	2
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Severe Thunderstorm *(Severe Weather)*	***Population Exposure***	High	30% or more of the population (including underserved population) is exposed to the hazard.	3	9
	Property Exposure	High	25% of the total assessed property is exposed to the hazard.	3	6
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Strong Winds/ Damaging Winds *(Severe Weather)*	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	Medium	10% to 24% of the total assessed property value is exposed to the hazard.	2	4
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1

Hazard Event	Vulnerability Factor	Vulnerability		Vulnerability Factor	Weighted Factor
Tornado *(Severe Weather)*	***Population Exposure***	Low	15% to 29% of the population (including underserved population) is exposed to the hazard.	1	3
	Property Exposure	Low	10% to 24% of the total assessed property value is exposed to the hazard.	1	2
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Tsunami	***Population Exposure***	Low	14% or less of the population (including underserved population) is exposed to the hazard.	1	3
	Property Exposure	Low	9% or less of the total assessed property value is exposed to the hazard.	1	2
	Changes in Development	No Vulnerability	Changes in development had no effect and/or decreased the vulnerability of the community to the hazard.	0	0
Wildfire	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	Medium	10% to 24% of the total assessed property value is exposed to the hazard.	2	4
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Active Shooter Incidents	***Population Exposure***	Low	14% or less of the population (including underserved population) is exposed to the hazard.	1	3
	Property Exposure	Low	9% or less of the total assessed property value is exposed to the hazard.	1	2
	Changes in Development	No Vulnerability	Changes in development had no effect and/or decreased the vulnerability of the community to the hazard.	0	0
Cybersecurity Threats	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	No Vulnerability	None of the total assessed property value is exposed to the hazard.	0	0
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Hazardous Materials Incidents	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	Medium	10% to 24% of the total assessed property value is exposed to the hazard.	2	4

Hazard Event	Vulnerability Factor	Vulnerability		Vulnerability Factor	Weighted Factor
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Terrorism (Weapons of Mass Destruction)	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	Medium	10% to 24% of the total assessed property value is exposed to the hazard.	2	4
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1
Utility Interruptions	***Population Exposure***	Medium	15% to 29% of the population (including underserved population) is exposed to the hazard.	2	6
	Property Exposure	No Vulnerability	None of the total assessed property value is exposed to the hazard.	0	0
	Changes in Development	Low	Changes in development have minimally increased the vulnerability of the community to the hazard by 4% or less.	1	1

D.4. Impact Factors

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
Climate Change	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	Low	Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support, and/or minimal repair, clean-up, restoration, or preservation work.	1	1

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3	3
Dam and Levee Failure	***Population and Life Safety***	Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2	6
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6
	Property Damage	Medium	More than $500,000 but less than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to more than 5% but less than 15% of the property value within the jurisdiction.	2	4
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2
	Environmental	Medium	Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work.	2	2
	Essential Operations	Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2	2
	Future Development	Medium	Future development trends will increase the impact/consequence of this hazard, but not significantly.	2	2
	Climate Change	Medium	Climate Change trends will increase the risk of this hazard and its impacts, but not significantly.	2	2
Drought	***Population and Life Safety***	Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2	6
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2
	Environmental	Low	Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support, and/or minimal repair, clean-up, restoration, or preservation work.	1	1
	Essential Operations	High	Impact greater than 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	3	3
	Future Development	Medium	Future development trends will increase the impact/consequence of this hazard, but not significantly.	2	2
	Climate Change	High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3	3
Earthquake	***Population and Life Safety***	High	Populations exposed to this hazard are likely to experience significant adverse impacts, such as fatalities and severe injuries.	3	9
	Underserved/Equity	High	Underserved populations exposed to the hazard are likely to experience significant adverse/disproportionate impacts, such as fatalities and severe injuries.	3	9
	Property Damage	High	More than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to 15% or more of the property value within the jurisdiction.	3	6
	Economic	High	Where the total economic impact is likely to be greater than $10 Million.	3	3
	Environmental	High	Environmental impact from a single major hazard event is likely to be significant, requiring extensive outside resources and support; and/or repair, clean-up, restoration, and/or preservation work.	3	3
	Essential Operations	High	Impact greater than 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	3	3
	Future Development	High	Future development trends will significantly increase the impact/consequence of this hazard.	3	3

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Climate Change	No Impact	Climate change trends will not increase the risk of the hazard and its impacts.	0	0
Flood (Riverine/Creek)	***Population and Life Safety***	Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2	6
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6
	Property Damage	High	More than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to 15% or more of the property value within the jurisdiction.	3	6
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2
	Environmental	Medium	Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work.	2	2
	Essential Operations	Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2	2
	Future Development	Medium	Future development trends will increase the impact/consequence of this hazard, but not significantly.	2	2
	Climate Change	High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3	3
Flood (Urban/Flash Flood)	***Population and Life Safety***	Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2	6
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6
	Property Damage	High	More than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to 15% or more of the property value within the jurisdiction.	3	6
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Environmental	Medium	Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work.	2	2
	Essential Operations	Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2	2
	Future Development	Medium	Future development trends will increase the impact/consequence of this hazard, but not significantly.	2	2
	Climate Change	High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3	3
Heat Wave/Extreme Heat *(Severe Weather)*	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6
	Property Damage	No Impact	Little to no property damage is expected from a single major hazard event.	0	0
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	No Impact	No environmental impacts from a single major hazard event are likely.	0	0
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3	3
Heavy Rainfall *(Severe Weather)*	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	Low	Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support, and/or minimal repair, clean-up, restoration, or preservation work.	1	1
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3	3
Landslide	***Population and Life Safety***	Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2	6
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	Medium	Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work.	2	2
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	Medium	Climate Change trends will increase the risk of this hazard and its impacts, but not significantly.	2	2

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
Sea Level Rise	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3
	Property Damage	Medium	More than $500,000 but less than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to more than 5% but less than 15% of the property value within the jurisdiction.	2	4
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2
	Environmental	Medium	Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work.	2	2
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Medium	Future development trends will increase the impact/consequence of this hazard, but not significantly.	2	2
	Climate Change	High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3	3
Severe Thunderstorm *(Severe Weather)*	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	Low	Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support, and/or minimal repair, clean-up, restoration, or preservation work.	1	1

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	Medium	Climate Change trends will increase the risk of this hazard and its impacts, but not significantly.	2	2
Strong Winds/ Damaging Winds *(Severe Weather)*	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3
	Property Damage	Medium	More than $500,000 but less than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to more than 5% but less than 15% of the property value within the jurisdiction.	2	4
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	Low	Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support, and/or minimal repair, clean-up, restoration, or preservation work.	1	1
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	Medium	Climate Change trends will increase the risk of this hazard and its impacts, but not significantly.	2	2
Tornado *(Severe Weather)*	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	Low	Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support, and/or minimal repair, clean-up, restoration, or preservation work.	1	1
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	Medium	Climate Change trends will increase the risk of this hazard and its impacts, but not significantly.	2	2
Tsunami	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	Low	Environmental impact from a single major hazard event is likely to be minimal, requiring little to no outside resources and support, and/or minimal repair, clean-up, restoration, or preservation work.	1	1
	Essential Operations	Low	Impact less than 24 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	1	1
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	Low	Climate Change trends will minimally increase the risk of this hazard and its impacts.	1	1

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
Wildfire	***Population and Life Safety***	Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2	6
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6
	Property Damage	Medium	More than $500,000 but less than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to more than 5% but less than 15% of the property value within the jurisdiction.	2	4
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2
	Environmental	Medium	Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work.	2	2
	Essential Operations	Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2	2
	Future Development	Medium	Future development trends will increase the impact/consequence of this hazard, but not significantly.	2	2
	Climate Change	High	Climate Change trends will significantly increase the risk of this hazard and its impacts.	3	3
Active Shooter Incidents	***Population and Life Safety***	Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2	6
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Low	Total economic impact is not likely to be greater than $100,000.	1	1
	Environmental	No Impact	No environmental impacts from a single major hazard event are likely.	0	0

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Essential Operations	Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2	2
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	No Impact	Climate change trends will not increase the risk of the hazard and its impacts.	0	0
Cybersecurity Threats	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2
	Environmental	No Impact	No environmental impacts from a single major hazard event are likely.	0	0
	Essential Operations	Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2	2
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	No Impact	Climate change trends will not increase the risk of the hazard and its impacts.	0	0
Hazardous Materials Incidents	***Population and Life Safety***	Low	Populations exposed to this hazard are likely to experience minimal adverse impacts, such as ambulatory injuries.	1	3
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6
	Property Damage	Low	Less than $500,000 in property damages is expected from a single major hazard event or less than 5% of the property value within the jurisdiction.	1	2
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Environmental	High	Environmental impact from a single major hazard event is likely to be significant, requiring extensive outside resources and support; and/or repair, clean-up, restoration, and/or preservation work.	3	3
	Essential Operations	Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2	2
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	No Impact	Climate change trends will not increase the risk of the hazard and its impacts.	0	0
Terrorism (Weapons of Mass Destruction)	***Population and Life Safety***	High	Populations exposed to this hazard are likely to experience significant adverse impacts, such as fatalities and severe injuries.	3	9
	Underserved/Equity	Low	Underserved populations exposed to the hazard are likely to experience minimal adverse/disproportionate impacts, such as ambulatory injuries.	1	3
	Property Damage	High	More than $5 Million in property damages is expected from a single major hazard event, or damages are expected to occur to 15% or more of the property value within the jurisdiction.	3	6
	Economic	High	Where the total economic impact is likely to be greater than $10 Million.	3	3
	Environmental	Medium	Environmental impact from a single major hazard event is likely to be localized, requiring some outside resources and support; and/or repair, clean-up, restoration, or preservation work.	2	2
	Essential Operations	High	Impact greater than 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	3	3
	Future Development	Low	Future development trends will minimally increase impact/consequence of this hazard.	1	1
	Climate Change	No Impact	Climate change trends will not increase the risk of the hazard and its impacts.	0	0
Utility Interruptions	***Population and Life Safety***	Medium	Populations exposed to this hazard are likely to experience some adverse impacts, such as injuries requiring acute medical care.	2	6

Hazard Event	Impact Factor	Impact		Impact Factor	Weighted Factor
	Underserved/Equity	Medium	Underserved populations exposed to the hazard are likely to experience some adverse/disproportionate impacts, such as injuries requiring acute medical care.	2	6
	Property Damage	No Impact	Little to no property damage is expected from a single major hazard event.	0	0
	Economic	Medium	Total economic impact is likely to be greater than $500,000, but less than or equal to $10 Million.	2	2
	Environmental	No Impact	No environmental impacts from a single major hazard event are likely.	0	0
	Essential Operations	Medium	Impact between 24 and 72 hours on the ability of the jurisdiction to meet the essential day-to-day operational demands and needs of the community from a single major hazard event.	2	2
	Future Development	No Impact	Future development trends will not increase the impact/consequence of the hazard, and/or may even decrease the impact/consequence of this hazard.	0	0
	Climate Change	Medium	Climate Change trends will increase the risk of this hazard and its impacts, but not significantly.	2	2

APPENDIX E. PLAN ADOPTION

[Placeholder for adoption documentation after State and FEMA Approval]

RESOLUTION NO. 2024 - 12

A RESOLUTION OF THE BOARD OF DIRECTORS OF DIABLO WATER DISTRICT ADOPTING THE 2024 CONTRA COSTA COUNTY HAZARD MITIGATION PLAN – VOLUME II: DIABLO WATER DISTRICT ANNEX

WHEREAS Diablo Water District recognizes the threat that natural hazards pose to people and property within Diablo Water District; and

WHEREAS Diablo Water District has prepared a multi-hazard mitigation plan, hereby known as the Contra Costa County 2024 Hazard Mitigation Plan – Volume II: Diablo Water District Annex, in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS the Contra Costa County 2024 Hazard Mitigation Plan – Volume II: Diablo Water District Annex identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local government) from the impacts of future hazards and disasters; and

WHEREAS adoption by Diablo Water District demonstrates its commitment to hazard mitigation and achieving the goals outlined in the Contra Costa County 2024 Hazard Mitigation Plan – Volume II: Diablo Water District Annex.

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of Diablo Water District, that:

Section 1. In accordance with California Water Code, Division 16 County Waterworks Districts, Diablo Water District adopts the 2024 Contra Costa County Local Hazard Mitigation Plan – Volume II: Diablo Water District Annex. While content related to Diablo Water District may require revisions to meet the plan approval requirements,

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changes occurring after adoption will not require Diablo Water District to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

* * * * *

I certify that the foregoing is a true and complete copy of a resolution duly adopted by the Board of Directors of Diablo Water District at a special meeting thereof, held on September 18, 2024, by the following vote:

AYES:

NOES:

ABSENT:

DATED:

_____

Kait Knight, Secretary