

## RESOLUTION 23-02

### A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SANTA MARIA VALLEY WATER CONSERVATION DISTRICT APPROVING THE DISTRICT'S HAZARD MITIGATION PLAN CONTINGENT ON RESOLUTION OF COMMENTS RECEIVED FROM FEMA

#### RECITALS

**WHEREAS**, the Santa Maria Valley Water Conservation District ("District") is a water conservation district organized and operating pursuant to Water Code section 74200 *et. seq.*; and

**WHEREAS**, the federal Disaster Mitigation Act of 2000, as described in 44 CFR § 201.6 ("Act") requires all public agencies to complete a Local Hazard Mitigation Plan in order to qualify for pre- and post-disaster mitigation funds; and

**WHEREAS**, the District has agreed to participate in a county-wide multi-jurisdictional plan with the County of Santa Barbara as the lead agency; and

**WHEREAS**, on or about June 1, 2022, the District submitted a Letter of Commitment as Participating Jurisdiction in Santa Barbara County Multi-Jurisdictional Hazard Mitigation Planning to the Count of Santa Barbara; and

**WHEREAS**, the District previously agreed to meet the requirements for mitigation plans identified in the Act and to provide such cooperation as is necessary and in a timely manner to Santa Barbara County to complete the plan in conformance with Federal Emergency Management Administration ("FEMA") requirements; and

**WHEREAS**, on April 14, 2023, the County of Santa Barbara received approval of the Santa Barbara County Multi-Jurisdiction Hazard Mitigation Plan 2022 from FEMA. The approval included a list of participating jurisdictions, which included the District; and

**WHEREAS**, the District has completed its updated Local Hazard Mitigation Plan as an annex to the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan; and

**WHEREAS**, the District desires to adopt this updated Local Hazard Mitigation Plan annex in accordance with the Act.

**NOW, THEREFORE, THE SANTA MARIA VALLEY WATER CONSERVATION DISTRICT HEREBY RESOLVES AS FOLLOWS:**

#### RESOLUTION

**Section 1.** The above recitals are all true and correct and hereby adopted as findings.

**Section 2.** The Santa Maria Valley Water Conservation District Board of Directors hereby approves the updated Local Hazard Mitigation Plan annex to the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan, and true and correct copy of which is attached hereto as Exhibit A and incorporated herein by reference.

**Section 3.** The updated Local Hazard Mitigation Plan will be submitted to FEMA for comment. The District will work with FEMA and CalOES to resolve any comment provided by FEMA.

**Section 4.** The Santa Maria Valley Water Conservation Board of Directors authorizes the Board President or designees to perform all duties to carry out the updated Local Hazard Mitigation Plan.

**Section 5.** The Santa Maria Valley Water Conservation District Board of Directors authorizes the Board President or designees to make necessary administrative and operational changes to the updated Local Hazard Mitigation Plan that are in keeping with the intent of the plan as approved.

**Section 6.** This resolution officially becomes a component part of the Santa Maria Valley Water District's Hazard Mitigation Plan.

**Section 7.** This Resolution shall take effect immediately upon its passage.

PASSED, APPROVED and ADOPTED at an open and public meeting and in conformance with the Brown Act by the Board of Directors of the Santa Maria Valley Water Conservation District, State of California, this 26<sup>th</sup> day of April 2023.

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Keith Hadick, President  
Santa Maria Valley Water Conservation District

ATTEST:

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Andy Adam, Secretary  
Santa Maria Valley Water Conservation District

APPROVED AS TO FORM:

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ALESHIRE & WYNDER, LLP  
G. Ross Trindle, III  
District Counsel

**EXHIBIT A**

Santa Maria Valley  
Water Conservation District  
**Local Hazard Mitigation Plan**



**An Annex to the Santa Barbara County  
Multi-Jurisdictional Hazard Mitigation Plan**

**February 2023**



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## 1.0 INTRODUCTION

Natural and human-caused disasters can lead to death, injury, property damage, and interruption of business and government services. When they occur, the time, money, and effort to respond to and recover from these disasters divert public resources and attention from other important programs and problems.

However, the impact of foreseeable yet often unpredictable natural and human-caused events can be reduced through mitigation planning. History has demonstrated that it is less expensive to mitigate against disaster damage than to repeatedly repair damage in the aftermath. A mitigation plan states the aspirations and specific courses of action jurisdictions intend to follow to reduce vulnerability and exposure to future hazard events.

The Santa Maria Valley Water Conservation District (SMVWCD or District) recognizes the consequences of disasters and the need to reduce the impacts of all hazards, natural and human-caused. This annex was prepared in 2022 as part of the update to the County of Santa Barbara (County) Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). This annex serves as the Local Hazard Mitigation Plan (LHMP) for the District. This is the first LHMP prepared for the District. Going forward, the District will:

- Incorporate the LHMP goals, objectives, and mitigation actions into its operations, management, and infrastructure planning and processes, including the Twitchell Project Manual.
- Use the LHMP's assessment of capabilities, hazards, and vulnerabilities to inform planning, infrastructure improvements, and programs, including outreach and engagement programs for dam management and water conservation.
- Implement mitigation actions through infrastructure planning, maintenance programs, grant programming, community outreach, and budget process.
- Review and evaluate mitigation actions before and after disasters, including wildfires in the Twitchell Reservoir watershed and regional droughts.

This LHMP builds on and refines the MJHMP's assessment of hazards and vulnerabilities countywide to develop a mitigation plan for the District. The District participated in the 2022 MJHMP Mitigation Advisory Committee (MAC) and Local Planning Team (LPT), reviewed all portions of the MJHMP pertaining to the District and incorporated relevant components into this annex. It contains updated capability assessment information, a current vulnerability assessment, and an updated/revised mitigation strategy. The methodology and process for developing this annex build on approaches employed in the 2022 MJHMP and are explained throughout the following sections.

The 2022 MJHMP update was prepared with input and coordination from each of the county's eight incorporated cities, six special districts, the County, citizen participation, responsible officials, and support from the State of California Governor's Office of Emergency Services (CalOES) and the Federal Emergency Management Agency (FEMA). The process to update the MJHMP and this LHMP included over a year of coordination with representatives from all participating agencies within the County and County representatives who comprised the MAC (described further in Section 3.0 below). The District is a participating agency in the County's MJHMP update.

The District's LHMP is used by local emergency management teams, decision-makers, and agency staff to implement needed mitigation to address known hazards. The MJHMP and this annex can also be used as a tool for all stakeholders to increase community awareness of local hazards and risks and provide information about options and resources available to reduce those risks. Informing and educating the public about potential hazards helps all county residents and visitors protect themselves against their effects.

Risk assessments were performed that identified and evaluated priority hazards that could impact the District. Vulnerability assessments summarize the identified hazards' impact on the District. Estimates of potential dollar losses to vulnerable structures are presented. The risk and vulnerability assessments were used to determine mitigation goals and objectives to minimize near-term and long-term vulnerabilities to the identified hazards. These goals and objectives are the foundation for a comprehensive range of specific attainable mitigation actions (see Section 7.0, *Mitigation Strategy*).

## 2.0 PLAN PURPOSE AND AUTHORITY

Federal legislation historically provided funding for disaster preparedness, response, recovery, and mitigation. The Disaster Mitigation Act (DMA) of 2000, also commonly known as "The 2000 Stafford Act Amendments" (the Act), constitutes an effort by the federal government to reduce the rising cost of disasters. The legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

Section 322 of the DMA requires local governments to develop and submit mitigation plans to qualify for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) funds. The 2022 MJHMP meets the statutory requirements of DMA 2000 (P.L. 106-390), enacted October 30, 2000, and 44 CFR Part 201 – Mitigation Planning, Interim Final Rule, published February 26, 2002. The HMA grants include the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, and the Flood Mitigation Assistance (FMA) program. Additional FEMA mitigation funds include the HMGP Post Fire funding associated with Fire Management Assistance Grant (FMAG) declarations and the Building Resilient Infrastructure and Communities (BRIC) funding associated with the 2018 Disaster Recovery Reform Act (DRRA).

DMA 2000 specifically addresses mitigation planning at the state and local levels. It identifies requirements that allow HMGP funds to be used for planning activities and increases the amount of HMGP funds available to states that have developed a comprehensive, enhanced mitigation plan before a disaster. State, county, and local jurisdictions must have an approved mitigation plan in place before receiving post-disaster HMGP funds. These mitigation plans must demonstrate that their proposed projects are based on a sound planning process that accounts for the risk to and the capabilities of the individual communities.

Local governments have certain responsibilities for implementing Section 322, including:

- Preparing and submitting a local mitigation plan;
- Reviewing and updating the plan every five years; and
- Monitoring mitigation actions and projects.

To facilitate implementation of the DMA 2000, FEMA created an Interim Final Rule (the Rule), published in the Federal Register in February of 2002 at section 201 of 44 CFR. The Rule spells out the mitigation planning criteria for states and local communities. Specific requirements for local mitigation planning efforts are outlined in section §201.6 of the Rule.

In March 2013, FEMA released The Local Mitigation Planning Handbook (Handbook) as the official guide for local governments to develop, update and implement local mitigation plans. The Handbook complements and references the October 2011 FEMA Local Mitigation Plan Review Guide (Guide) to help “Federal and State officials assess Local Mitigation Plans in a fair and consistent manner.” Local jurisdictions must demonstrate that proposed mitigation actions are based upon a sound planning process that accounts for the inherent risk and capabilities of the individual communities as stated in section §201.5 of the Rule. The Handbook and Guide were consulted to ensure thoroughness, diligence, and compliance with the DMA 2000 planning requirements.

DMA 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. It encourages and rewards local and state pre-disaster planning and promotes sustainability as a strategy for disaster resistance. This enhanced planning network is intended to enable local and state governments to articulate accurate needs for mitigation, resulting in a faster allocation of funding and more effective risk reduction projects.

This LHMP was prepared as an annex to the County’s MJHMP in compliance with DMA 2000 and applicable FEMA guidance. The following pages show the resolutions that adopt the District’s 2022 LHMP.

[INSERT RESOLUTION(S) ADOPTING PLAN UPDATE]

[INSERT RESOLUTION(S) ADOPTING PLAN UPDATE]



## 3.0 PLANNING PROCESS

### 3.1 OVERVIEW

The planning process implemented for the County's 2022 MJHMP update, including the District's LHMP update, utilized two different planning teams to review progress, inform and guide the update, and directly review and prepare portions of the plan, including each jurisdictional annex. The first team is the MAC and the second is the LPT.

All eight incorporated cities and the six special districts joined the County as participating agencies in the preparation of the MJHMP update, including cities of Buellton, Carpinteria, Goleta, Guadalupe, Lompoc Santa Barbara, Santa Maria, and Solvang; and special districts Cachuma Operation and Maintenance Board (COMB), Carpinteria Valley Water District (CVWD), Goleta Water District (GWD), Montecito Fire Protection District (MFPD), Montecito Water District (MWD), and SMVWCD. Each of the participating agencies had representation on the MAC and was responsible for the administration of their own LPT. In addition, the MAC included representatives from other state and local agencies with an interest in hazard mitigation in Santa Barbara County, including local non-profit organizations, special districts, and state and federal agencies. This composition ensures diverse input from an array of voices representing all communities within Santa Barbara County.

Both the MAC and the LPTs focused on these underlining philosophies, adopted from the FEMA Local Mitigation Plan Review Guide:

- **Focus on the mitigation strategy**

The mitigation strategy is the plan's primary purpose. All other sections contribute to and inform the mitigation strategy and specific hazard mitigation actions.

- **Process is as important as the plan itself**

In mitigation planning, as with most other planning efforts, the plan is only as good as the process and people involved in its development. The plan should also serve as the written record, or documentation, of the planning process.

- **This is the community's plan**

To have value; the plan must represent the current needs and values of the community and be useful for local officials and stakeholders. Develop the mitigation plan in a way that best serves your community's purpose and people.

- **Intent is as important as Compliance**

Plan reviews will focus on whether the mitigation plan meets the intent of the law and regulation; and ultimately that the plan will make the community safer from hazards.

As a result, the planning process incorporated the following steps:

- **Plan Preparation**

- Form/validate planning team members
- Establish common project goals
- Set expectations and timelines
- **Plan Development**
  - Validate and revise the existing conditions/situation within the planning area;
  - Develop and review the risk to hazards (exposure and vulnerability) within the planning area;
  - Review and identify mitigation actions and projects within the planning area;
- **Finalize the Plan**
  - Review and revise the plan
  - Approve the plan locally and with state and federal reviewers
  - Adopt and disseminate the plan

### 3.2 MITIGATION ADVISORY COMMITTEE (MAC)

The District participated as a MAC member to prepare this LHMP as an annex to the 2022 MJHMP. SMVWCD was represented by contract staff member Doug Pike, Principal Engineer, on the MAC.

The MAC meetings were designed to discuss each component of the MJHMP with MAC members and coordinate annex updates. Table 3-1 below provides a list and the main purpose and topics of each MAC meeting.

**Table 3-1. Mitigation Advisory Committee (MAC) Meetings Summary**

Date	Purpose
March 2021	<b>MAC Meeting #1 (virtual)</b> Provided an overview of the project and why the plan is being revised Reviewed FEMA guidance and processes Discussed roles and responsibilities of the participating jurisdictions
September 2021	<b>MAC Meeting #2 (virtual)</b> Reviewed goals of the project, role of the MAC Summarized public outreach results Presented hazards assessment and displayed select draft hazard maps Conducted interactive exercise to rank hazards
October 2021	<b>MAC Meeting #3 (virtual)</b> Provided results of hazard ranking methodology Presented vulnerabilities assessment Discussed mitigation goals, objectives, and strategies Reviewed County goals from 2017 and compared them to new goals Conducted interactive exercise on potential mitigation goals and strategies
October 2021	<b>MAC Meeting #4 (virtual)</b> Collected feedback on 2017 mitigation strategies

Date	Purpose
	Conducted interactive exercise on mitigation strategies for key hazards unaddressed in previous MJHMP Discussed annex updates
January 2022	<b>MAC Meeting #5 (virtual)</b> Presented draft plan Discussed key MAC/LPT review needs and key issues Discussed annex updates to dovetail with plan update
March 2022	<b>MAC Meeting #6 (virtual)</b> Review and discuss public comments received on the draft plan Recommend a revised draft plan for review and approval Review annex updates for review and approval

### 3.3 LOCAL PLANNING TEAM (LPT)

Table 3-2 lists the District's LPT. These individuals collaborated to identify the District's critical facilities, provide relevant plans, report on the progress of District mitigation actions, and provide suggestions for new mitigation actions.

**Table 3-2. SMVWCD Local Planning Team 2022**

Name	Title
Doug Pike	Contract Staff/Principal Engineer
Thomas Gibbons	Acting General Manager
Taylor Gilikson	Environmental Planner

The SMVWCD LPT members worked directly with the County Office of Emergency Management (OEM), the consultant team, and each other to provide data, recommended changes, and continually work on the MJHMP and LHMP updates throughout the planning process. The SMVWCD LPT met virtually as needed during the planning process to discuss data needs and organize data collection. Table 3-3 below outlines a timeline of the LPT's activities throughout the planning process.

**Table 3-3. Local Planning Team Activity Summary**

Meeting Dates	Summary of Activity
February 2020	LPT kickoff meeting to discuss stakeholder and public involvement and refine the scope of hazard analysis
April 2021 to January 2022	Collated data to share with hazard mitigation planning team, including hazard identification, refreshed data layers for maps, and geographic settings. Completed Plan Update Guides to directly inform hazard priorities and mitigation capabilities Met with County OEM and consultant staff (1/25/22) to discuss LHMP priorities and mitigation approaches.
January and May 2022	Reviewed new maps and local vulnerabilities. Provided input on the status of LHMP mitigation strategies. Reviewed draft mitigation strategies and provide feedback.

Meeting Dates	Summary of Activity
	Reviewed and finalized 2022 LHMP

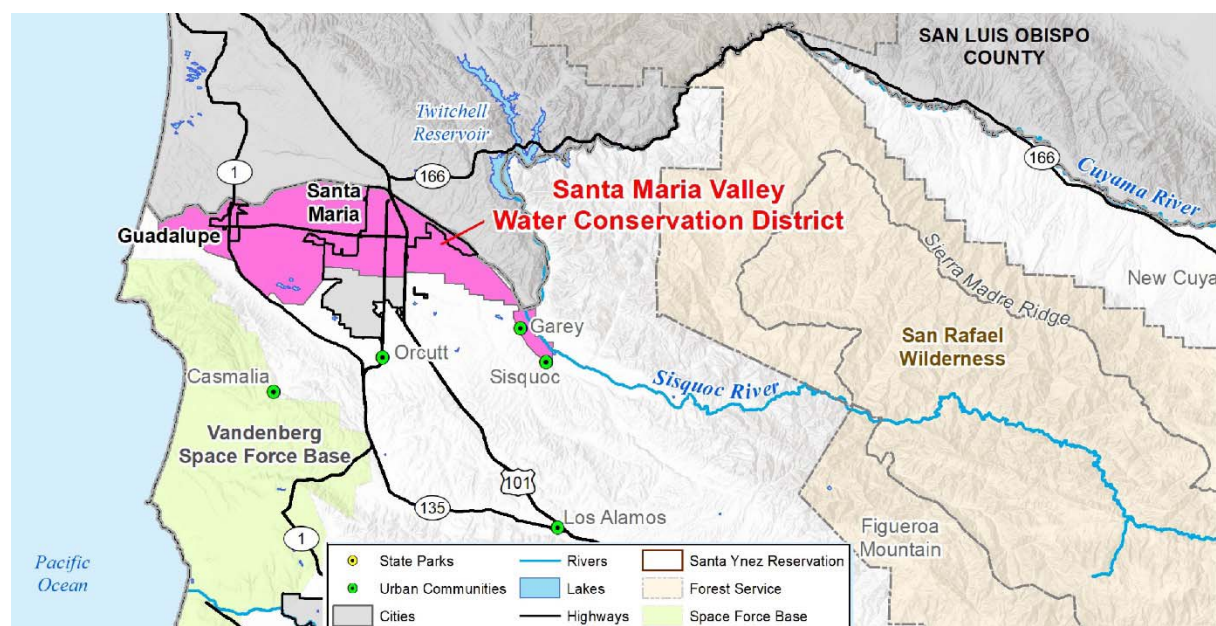
### 3.4 PUBLIC OUTREACH AND ENGAGEMENT

As a participating agency in the 2022 MJHMP update, the District was directly involved in the outreach program undertaken by the County for the 2022 MJHMP update, which involved extensive outreach during 2021 and early 2022. The District's MAC and LPT members participated in public outreach efforts for the MJHMP and LHMP update planning process by distributing notices for the 6-month-long community hazards survey (refer to Section 3.4.1 of the 2022 MJHMP) and three public workshops (refer to Section 3.4.4 of the MJHMP). The Public Outreach Plan (POP) employed a diversity of tools to maximize notification and participation. The POP was responsive to limitations presented by the Coronavirus (COVID-19) pandemic and focused on direct bilingual outreach using a variety of digital tools, including a fact sheet, social media posts, emails, and press releases. Multiple platforms and tools were used to publicize opportunities to participate. All public and stakeholder meetings were hosted virtually through Microsoft Teams, and all outreach completed for the project was conducted via electronic communications. Many of the meetings used an interactive tool called Slido to collect feedback during meetings. Slido allows audience members to answer questions during presentations, helping the County collect direct detailed feedback and facilitate discussion. All written notices were made available in English and Spanish.

In May 2022, the draft LHMP was completed and submitted for review by FEMA and CalOES as part of the MJHMP.

## 4.0 CAPABILITY ASSESSMENT

The SMVWCD office is located in the southern part of the City of Santa Maria. The District stretches from the City of Guadalupe, covering the northern half of the City of Santa Maria, and extends southeast of the City of Santa Maria to the communities of Garey and Sisquoc (Figure 4-1). SMVWCD provides water conservation and groundwater basin recharge, flood control, and oversees operations at Twitchell Dam and Reservoir. The District overlies the Santa Maria Valley Groundwater Basin, which is divided into three management areas: the Santa Maria Valley Management Area (SMVMA), the Nipomo Mesa Management Area, and the Northern Cities Management Area. The SMVMA includes approximately 175 square miles in northern Santa Barbara and southern San Luis Obispo counties. Surrounding the SMVMA are the Casmalia and Solomon Hills to the south, San Rafael Mountains to the southeast, Sierra Madre Mountains to the east and northeast, the Nipomo Mesa to the north, and the Pacific Ocean to the west. The main source of water to the basin is the Santa Maria River, which generally flanks the northern part of the Santa Maria Valley; other streams include portions of the Cuyama River, Sisquoc River, and tributaries, and Orcutt Creek.

**Figure 4-1. District Service Area**

The District's LPT identified current capabilities available for implementing hazard mitigation activities, including administrative, technical, legal, and fiscal capabilities. This assessment includes a summary of departments and their responsibilities associated to hazard mitigation planning, as well as codes, ordinances, and plans already in place associated to hazard mitigation planning. The assessment also provides the District's fiscal capabilities that may apply to providing financial resources to implement identified mitigation action items.

#### 4.1 ADMINISTRATIVE AND TECHNICAL CAPACITY

The SMVWCD is divided into seven divisions or regions. There is also seven Board of Directors, each elected by citizens in their division to serve a four-year term. Some of the directors also sit on various committees of the District, including the Financial, Twitchell Operations, and Regional Water Issues Coordination committees. In addition to the Board of Directors, the District employs 3 full-time staff, including a District Secretary and two Dam-tenders.

Twitchell Dam and Reservoir are designed for the protection of the Santa Maria Valley from flood and drought. The dam catches excess rain runoff from the Cuyama watershed and stores it in the reservoir protecting the valley from a flood. Water is slowly discharged into the Santa Maria River, which serves as the main recharge source for the local aquifer. The aquifer provides water for the residents and agricultural industry of the Santa Maria Valley.

The Acting General Manager is generally a Board member appointed by the Board of Directors, to perform administrative duties in behalf of the District, with Board supervised responsibility for planning, organizing, coordinating, and directing all District operations. Budgets are set and managed by the Finance Committee consisting of three appointed Board members and supported by a CPA consultant. Employee decisions and supervision are provided by the Employee Committee consisting of three assigned Board Members. The General Manager is responsible for the implementation of policies established by the Board of Directors as well as all day-to-day activities

of the District. The Dam Technical Operations Committee consists of three appointed Board members and directs or recommends operations at the Dam, as authorized by the full Board of Directors.

Engineering support is provided by a consulting engineer not classified as an employee. The consulting engineer to the District reports to the General Manager or the Board of Directors, and is responsible for engineering, designing, and implementing capital improvements within and for the District. This position requires a Professional Engineers certification. The position involves oversight of professional consultants as well as detailed analysis and design for work performed. The District Engineer also supports water conservation programs and Bureau of Reclamation activities related to downstream groundwater recharge.

The administrative and technical capabilities of the District, as shown in Table 4-1, include staff, personnel, and other resources available to implement the actions identified in Chapter 7.0, *Mitigation Strategy*. Specific resources reviewed include those involving technical personnel such as planners/engineers with knowledge of land development and land management practices, engineers trained in construction practices related to building and infrastructure, planners and engineers with an understanding of natural or manmade hazards, and floodplain managers.

**Table 4-1. SMVWCD Administrative and Technical Capacity**

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	No	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Contracted
Planner/engineer/scientist with an understanding of natural hazards	Yes	Contracted
Personnel skilled in GIS	Yes	Contracted
Full-time building official	No	
Floodplain manager	No	
Emergency manager	Yes	Acting General Manager, County OES
Grant writer	Yes	Contracted
Other personnel	Yes	On-site dam tender, District Secretary, contracted surveyor
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Contracted
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Emergency Action Plan

Personnel Resources	Yes/No	Department/Position
Other		

## 4.2 LEGAL AND REGULATORY CAPABILITIES

The District uses several regulatory tools for its operation. The District abides by the floodplain ordinance, building code, and erosion/sediment control program from the County of Santa Barbara, and California State fire codes. The District worked closely with other partners on the Twitchell Management Plan, Twitchell Project Manual, and Twitchell Sediment Survey Report (described further in Section 4.4 below). The District has Operational/Maintenance Plans, and flood insurance studies informed by capacity surveys and sediment studies of the dam.

The legal and regulatory capabilities of SMVWCD are shown in Table 4-2, including existing ordinances and codes that affect the physical or built environment of the District. Examples of legal and/or regulatory capabilities can include building codes, zoning ordinances, subdivision ordinances, special purpose ordinances, growth management ordinances, site plan review, general plans, capital improvement plans, economic development plans, emergency response plans, and real estate disclosure plans.

**Table 4-2. SMVWCD Regulatory Capability**

Regulatory Tool (ordinances, codes, plans)	Yes/No
General Plan	No
Zoning ordinance	No
Subdivision ordinance	No
Growth management ordinance	No
Floodplain ordinance	Yes
Other special-purpose ordinances (stormwater, steep slope, wildfire)	No
Building code	Yes
Fire code	Yes
Fire department ISO rating	N/A
Erosion or sediment control program	Yes
Stormwater management program	Yes
Site plan review requirements	Yes
Capital improvements plan	Yes
Economic development plan	No
Local emergency operations plan	Yes
Other special plans	Yes
Flood insurance study or other engineering studies for streams	Yes



<b>Regulatory Tool (ordinances, codes, plans)</b>	<b>Yes/No</b>
Elevation certificates (for floodplain development)	No

### 4.3 FINANCIAL RESOURCES

The District's major economic drivers for its revenue base are sales tax, population growth, and employment. The District's fiscal year (FY) 2021 annual budget is \$919,950, an increase of \$30,721 over FY 2020 annual budget. Annual debt obligations are \$0. The District reviews and adjust rates on an annual basis.

**Table 4-3. SMVWCD Fiscal Capability**

<b>Financial Resources</b>	<b>Accessible or Eligible to Use (Yes/No)</b>	<b>Has This Been Used for Mitigation in the Past?</b>	<b>Comments</b>
Community Development Block Grants (CDBG)	No	No	
Capital improvements project funding	Yes	Yes	Limited Resource
Authority to levy taxes for specific purposes	Yes	Yes	Restricted to the extent allowed by law
Fees for water and sewer service	No	No	
Incur debt through general obligation bonds	No	No	
Incur debt through special tax bonds	No	No	
Incur debt through private activity	No	No	
Federal Grant Programs (Hazard Mitigation Grant Program)	Pending	No	Eligibility in process

### 4.4 EDUCATION AND OUTREACH CAPABILITIES

This type of local capability refers to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information. Examples include natural disaster or safety-related school programs; participation in community programs such as Firewise or StormReady; and activities conducted as part of hazard awareness campaigns such as an Earthquake Awareness Month (February each year), National Preparedness Month (September), or the Great California ShakeOut (a statewide earthquake drill that happens annually on the third Thursday of October). The District can capitalize on its existing educational capacities and build new capabilities to educate the larger community on hazard risk and mitigation options.



In addition to the countywide resources described in Section 4.2.5, *County Education and Outreach Capabilities*, this section describes several existing outreach programs that are used to promote community awareness and readiness for natural disasters and hazards in the District.

- The District maintains a website available for outreach postings and communications
- The District maintains a contact list of immediate neighbors, those in the floodplain below the dam, and other parties of interest for focused outreach and communication
- The District maintains sub-committees with public agendas and postings for outreach and communications
- The City publishes Public Notices for meetings addressing issues requiring public notices

### 4.5 RELEVANT PLANS, POLICIES, AND ORDINANCES

The District has a range of guidance documents and plans that help guide District operations and monitor progress at Twitchell Dam and the SMVWCD.

#### 4.5.1 Santa Maria Valley Management Area 2020 Annual Report of Hydrogeologic Conditions - Water Requirements, Supplies, and Disposition

The Santa Maria Valley Management Area (SMVMA) Annual Report provides an assessment of hydrogeologic conditions in the groundwater subbasin. The report is compiled from information derived from the monitoring program for the SMVMA, including groundwater level, groundwater quality data, and groundwater conditions, as well as water use in the SMVMA, including demand, supply, and disposition. This report found that the hydrogeologic conditions in 2020 showed that groundwater levels were similar to or slightly lower than those in 2019, with one localized low in the Twitchell Recharge Area. Operation of the Twitchell Reservoir has continued to provide conservation of runoff for subsequent release for groundwater recharge despite sedimentation that has now filled the former dead pool storage below the conservation pool of the Reservoir. General mineral and nitrate concentrations were elevated in streams in the western and southern portions of the SMVMA. The total water requirement for the SMVMA in 2020 was 128,720 acre-feet per year (AFY), compared to 120,285 AFY the year before, but municipal water use was consistent with long-term trends for the SMVMA. The report found no evidence of severe water shortage conditions in the SMVMA in 2020.

#### 4.5.2 Twitchell Reservoir – Results of 2018 Aerial Survey and Sedimentation Update

This document was prepared by the SMVWCD and an engineering firm to update the volume capacity tables for Twitchell Reservoir and provide current data regarding sedimentation influx to the reservoir. An aerial survey was performed in November 2018 as the basis for this report. The lowest point in the reservoir is now 20 feet above the lowest measured point in the 2012 survey. The reservoir had an original total design water capacity of 240,000 acre-feet at the spillway crest, achieved at elevation 651.5 feet, with a design 100-year sediment capacity of 40,000 acre-feet. Overall, 121.08 acre-feet of new sediment were washed into the lower basin of the reservoir. 81 acre-feet of sediment that 2017 storms brought to the immediate area of the intake structure occlude over 50 percent of the inlet capacity of the outlet works. The report concludes that this

inflow of sediment is the largest single event impacting operations of the dam since its construction and that the District must expedite work to remove sediment impeding operations and assure the outlet works remain functional so that the dam can perform its flood control function.

#### 4.5.3 Twitchell Project Manual August 2020

The Twitchell Project Manual discusses the history of the dam and reservoir, maintenance, and capital projects and is intended to supplement the existing operations and procedures manual for Twitchell Dam and Reservoir. This Manual provides recommendations for capital and maintenance projects that will support the continued success of the facility to maximize recharge of the Santa Maria Management Area. This particularly includes strategies to mitigate the negative impacts of the increasing sedimentation in the reservoir that is affecting both water conservation capacity and the function of the outlet works. Throughout the facility's operational life of over 40 years, no water has been bypassed from storage for subsequent release for recharge. At the water conservation storage elevation of 623 (water conservation storage elevation boundary), the capacity of the reservoir has changed from 112,205 acre-feet in 2000 to a 2007 capacity of 110,482 acre-feet. In some areas of the lower reservoir sediment levels have raised as much as 11 feet. In areas of the upper reservoir, some channels have been cut by as much as 20 feet. This manual also presents Geographic Information Systems (GIS) map tools of the reservoir and Cuyama River Basin, and references and summarizes in one place the culmination of studies and knowledge to date on sedimentation issues at the Dam.

#### 4.6 OPPORTUNITIES FOR MITIGATION CAPABILITY IMPROVEMENTS

The District continuously strives to mitigate the adverse effects of potential hazards through its existing capabilities while also evaluating the opportunities for improvements. Based on the capability assessment, the District has existing regulatory, administrative/technical, education/outreach, and fiscal mechanisms in place that help to mitigate hazards. In addition to these existing capabilities, there are opportunities for the District to expand or improve on these policies and programs to further protect the community.

- **Regulatory Opportunities:** In alignment with the District's purpose, continued assessment of sedimentation, flood vulnerability, dam stability, and water source sustainability would improve the District's capabilities to ensure safe, reliable, and sustainable water sources to District customers. These would be critical in the event of structural issues at Twitchell Reservoir.
- **Administrative/Technical Opportunities:** As part of this update, the District aims to improve its resilience to ensure emergency response operations and water conservation can be sustained. Potential mitigations include including seismic upgrades and energy reliability and back-up systems for core infrastructure and facilities. Additional detail on how the District seeks to improve hazard mitigation capabilities through specific projects is detailed in Section 7.0.
- **Outreach Opportunities:** The District also seeks to actively increase the public's awareness and support for hazard mitigation projects by participating with agencies such as the City of Santa Maria and the County of Santa Barbara and educating the public about the ways in which planned capital spending can increase resiliency and minimize vulnerabilities. These outreach

efforts with the public and other local agencies are an important component of both preparing for emergencies and ensuring regional resiliency.

- **Fiscal Opportunities:** The District reviews capital spending priorities annually through a Board adopted budget, and seeks to mitigate hazards by identifying and addressing vulnerabilities in existing facilities while incorporating hazard-resistant designs into future investments. The District can pursue grants to fund mitigation efforts aimed at water conservation, dam stability, and fire protection (as described in the mitigation section). Additionally, the District plans to update its capital improvement/ facilities plan to reflect the information gathered for this Hazard Mitigation Plan.

## 5.0 HAZARD ASSESSMENT

### 5.1 OVERVIEW

The purpose of this section is to review, update, and/or validate the hazards identified for the 2022 SMVWCD LHMP. The intent is to confirm and update the description, location and extent, and history of hazards facing the District now and in the future. This assessment also considers the potential exacerbating effects of climate change. The importance of this review is to ensure that decisions and mitigating actions are based on the most up-to-date information available.

Another purpose of this section is to screen the hazards to determine their relative probability and severity to inform the risk posed to various communities and resources. This assessment will provide an understanding of the significance by ranking hazards by their priority in the District.

In 2021, the MAC reviewed and revised 1) the list of hazards by community or geographic area; 2) the information and material presented for each hazard; and 3) the prioritization of the hazards. The SMVWCD LPT refined the list of hazards applicable to the District and confirmed the hazard prioritization. The following sections provide the results of this effort.

### 5.2 HAZARD SCREENING/PRIORITIZATION

The Hazard Assessment presented here reflects the District's 2022 review and modifications to the updated risk assessment presented in Chapter 5.0, *Hazard Assessment*, and Chapter 6.0, *Vulnerability Assessment* of the 2022 MJHMP. A comprehensive treatment of hazards and their descriptions may be found in Chapter 5.0 of the Santa Barbara County 2022 MJHMP. Applicable hazard information from 2022 MJHMP was incorporated during the development of this section.

The potential extent, probability, frequency, and magnitude of future occurrences were all used to identify and prioritize the list of hazards most relevant in the District. The SMVWCD LPT completed the Plan Update Guide to rank the hazards and identify key hazards to help inform this assessment (Appendix A). As summarized in Table 5-1, the local priority hazards in the District are based on the screening of frequency/probability of occurrence, geographic extent, potential magnitude/severity of the hazard, and overall significance. Local experience, MAC/LPT input, and community feedback also informed the assessment of local priority hazards. After reviewing the localized hazard maps and exposure/loss assessment provided in the 2022 MJHMP, the following

hazards were identified by the SMVWCD LPT as their top priorities (Appendix A). A brief rationale for each hazard is included below. This assessment and description of key hazards are provided in addition to the 2022 MJHMP's comprehensive assessment of regional hazards that may affect the District.

**Table 5-1. SMVWCD Local Priority Hazards**

Hazard Type and Ranking	Score	Planning Consideration Based on Hazard Level
Sediment Flows	14	Significant
Flooding	13	Significant
Dam/Levee Failure	12	Significant
Wildfire	12	Significant

To continue compliance with the DMA of 2000, the District accepts the County's natural hazard profiles presented in Chapter 5.0, *Hazard Assessment* with the following notes and refinements or elaborations provided specifically for the SMVWCD in subsections below. The District's LPT acknowledged other hazards are either not a threat, are highly unlikely within the District boundaries, or are adequately addressed by the 2022 MJHMP and do not require additional information to be relevant to the SMVWCD hazard setting; therefore, these hazards are not addressed further in the District's LHMP. These additional hazards are being addressed in the more comprehensive 2022 MJHMP.

## 5.3 HAZARD PROFILES

### 5.3.1 Sediment Flows

The SMVWCD LPT determined that debris flows and sedimentation represented the most viable hazard to the District. A debris flow is a geological phenomenon in which water-laden masses of soil and fragmented rock rush down mountainsides, funnel into stream channels, collect objects in their paths, and form thick, muddy deposits on valley floors, creek beds, and reservoirs. Some debris flows are very fast - in areas of steep slopes, some debris flows can reach speeds of over 100 miles per hour. Sedimentation that flows more gradually also has the potential for damage. Sediment flows in the District can damage access roads, cause culverts to fail, and deposit sediments into the Twitchell Reservoir, depleting crucial water carrying capacity. This creates hazardous conditions that make it more difficult for the dam to facilitate flood control.

Debris flows can be triggered in several different ways including rainfall, erosion, landslides, and wildfires. A sudden flow of water from heavy rain, or rapid snowmelt, can be channeled over a steep valley filled with debris that is loose enough to be mobilized. The water soaks down into the debris, lubricates the material, adds weight, and triggers a flow. Streams often erode materials along their banks, cutting into thick deposits of saturated materials stacked high up the valley walls. This erosion removes support from the base of the slope and can trigger a flow of debris. Some debris flows originate from older landslides. These older landslides can be unstable masses perched upon a steep slope. A flow of water over the top of the old landslide can lubricate the slide material,

or erosion at the base can remove support, triggering a debris flow. Some debris flows occur after wildfires have burned the vegetation from a steep slope or after logging operations have removed vegetation. Before the fire or logging, the vegetation's roots anchored the soil on the slope and removed water from the soil. The loss of support and accumulation of moisture can result in increased rates of sedimentation within a watershed or could become a catastrophic failure. Rainfall that was previously absorbed by vegetation now runs off immediately. A moderate amount of rain on a burn scar can trigger a large debris flow.

**2010/11** - Heavy storms during the 2010/2011 winter storms brought unusually large amounts of sediment from drought and burn areas into the Twitchell Reservoir and damaged the access road to the reservoir (Table 5-2). Just before the storms, the facilities were cleaned from long-term sedimentation, and the severe sedimentation was a major setback. Moreover, the storms added an estimated \$350,000 worth of damage to the access road.

**2017** - In 2017, late January storms (FEMA-4308-DR-CA 2017) in the Huasna Watershed brought unforeseen, drastic amounts of sediment into the Twitchell Reservoir infrastructure. The dam received over 19 inches of total precipitation and 67,000 acre-feet of inflow. A disproportionate amount was from the Huasna watershed. Because of the critical impacts of this storm the following detail is provided.

### **Background**

The 2017 Storms followed two decades of significant fires in the watershed for Twitchell reservoir, which has severely impacted the sensitivity of the watershed to debris flows and sedimentation at Twitchell Dam. The 2017 storms were significant storm events in the watershed, and severe sedimentation impacts on the outlet works were suspected. The water releases were unusually full of sediment, impacting downstream water-flow control structures: The Stilling Basin (in which the critical-to-subcritical flow/hydraulic jump occurs, and the "Keyhole" which also slows the flow as water enters the downstream river channel). Unusually high volumes of sediment were passed through the Dam.

As soon as possible, the reservoir was drained through controlled releases so that an aerial topographic survey of the basin could be completed. The purpose of the survey was to determine impacts to the Outlet Works (Upstream Intake Structure) by sediment brought down in the heavy flows of the 2017 storms. This effort is also in support of our claim for sediment removal funding from FEMA-4308-DR-CA 2017 Storms.

This summary of findings is the result of Post-Storm Basin Capacity Survey (2018) comparing to the most recent Pre-storm Basin Capacity Survey (2012).

The information summarized herein is the result of a comparison of the Topographic surveys pre-flood (2012) and post flood (2018). Surveys are normally performed every 5+/- years or more frequently, if a significant storm occurs. The results are as follows:

### **Summarized Results:**

1. Overall, 121.08 acre-feet of new sediment was washed into the lower basin of the reservoir (Defined as the El 566 contour line. See map Below

2. The photographs above show visually the impact from the measured 81 Acre-feet of sediment that the storms brought to the immediate area of the intake structure.
3. 84.71 acre-feet of sediment increase was washed below the 530 El contour line.
4. 81.13 acre-feet of sediment increase was washed below the 527 El contour line.
5. The top of the intake structure is at El 526. This means that the 81.13 acre-feet of sediment increase below the 527 El contour line is directly impacting the Intake Structure.
6. Sediment levels at the Intake Structure itself have increased 43.4 feet, inundating the lower portal opening, and inundation  $\frac{3}{4}$  of the upper opening and trash racks.

**Additional observations:**

1. Sediment has flowed into and blocked the outlet tunnel between the Inlet Structure and the release gates, located in the center of the dam.
2. Sediment has filled the stilling basin and Keyhole structures. Estimated sediment in the Stilling Basin is 120 CY and in the Keyhole is 3800 CY. See attached drawing of these two features.

**Statement of Severity of this problem:**

This inflow of sediment is the largest single event impacting operations of the Dam since it's construction. This is a Category III Dam and is the first line of defense against flooding the Santa Maria Valley and its communities. The District must expedite work to remove sediment impeding operations and assure the outlet works remain functional so that the dam can perform its flood control function.

**2018** - On January 9th, 2018, Santa Barbara County experienced a debris flow event as a secondary impact of the 2017 Thomas Fire and subsequent rainfall. The Thomas Fire burned a significant portion of the Los Padres National Forest in the upstream watersheds of Twitchell Reservoir (see Section 5.3.4, *Wildfire*). This fire did not burn close to District infrastructure, but similar sedimentation impacts to the other disasters were observed. According to the event's After-Action Report, millions of tons of mud and rocks flowed out of the mountains toward the ocean creating sedimentation along the way. Lots of this sediment ended up in the Twitchell Reservoir, significantly reducing the capacity of the dam for flood control.

Given these regional conditions, sediment flows have a high probability of happening again and could cause significant impacts to District facilities and operations (see Section 6.1.1, *Sediment Flows and Flooding*).

**Table 5-2. SMVWCD Historic Sediment Flows**

Year	Name of Disaster	Details
1960	Outlet works plugged	The storm surge caused the Twitchell outlet works to be plugged
1983-84	Lower portal plugged	The large storm brought a heavy flow of sediment into Twitchell
2000	Emergency Sediment Removal Project	1998 large storm brought a heavy flow of sediment into Twitchell Reservoir

Year	Name of Disaster	Details
2002	Emergency Sediment Removal Project	Heavy rainstorm 2001 caused sediment flow
2006	Mudflow discharge	Bottom Sediment & Water (BSW) release 12,000 cubic yards
2009	La Brea Fire 40 square mile burn	August 08, 2009 - Aug 22, 2009, dump sediment in Twitchell Reservoir via Cuyama River
2009	Mudflow discharge	Bottom Sediment & Water (BSW) release 626,000 cubic yards
2009	Mudflow discharge	Downstream Cuyama River plugged
2010-11	FEMA 1952-DR-CA-winter storms of 2009	Mudslides damage Twitchell Dam's infrastructure
2018	Montecito Debris Flow	Thomas Fire burned Los Padres National Forest in late 2017, sediment and debris flows followed heavy rains in early 2018

Climate change is now playing a significant role in increasing the frequency and severity of wildfires, which could lead to an increase in sediment flows. The effects of climate change have the potential to impact wildfire behavior, the frequency of ignitions, fire management, and fuel loads. Increasing temperatures may intensify wildfire threat and susceptibility to more frequent wildfires in the county. As climate change affects the length of the wildfire season, a higher frequency of large fires may occur into late fall, when conditions remain dry and then be followed immediately by intense rains early in the winter. More high-intensity precipitation events could lead to an increase in sediment flow frequency (refer to Section 5.3.5, *Mudflow & Debris Flow* of the MJHMP).

### 5.3.2 Flood

Flooding is a temporary condition whereby land that is typically dry is partially or completely inundated. The severity of a flood is predicated on rainfall intensity and duration, soil saturation, soil type, permeability, slope, and watershed characteristics. The failure of stream banks, levees, dams, and under-sizing of stormwater facilities road culverts can all contribute to flooding. As described above, debris such as rocks and vegetation within a watershed can be mobilized under certain conditions of flood flows caused by heavy precipitation. Floods usually occur during the rainy season, with the highest precipitation during December through March. Streamflow throughout the reservoir is highly variable and directly impacted by rainfall with little snowmelt or base flow from headwaters. Watercourses can experience dramatic peak flows during high rainfall events. High amounts of sedimentation during wet years and high amounts of vegetative growth during dry and moderate years can affect stream or river channel capacity to carry floodwaters.

The general topography of the District's area and the Santa Maria Valley is flat resulting in minor to moderate flooding issues following heavy rainfall in a short period. Twitchell Dam is a critical flood control device for the Santa Maria Valley. Combined with the Santa Maria River levee systems, the dam retains floodwaters and substantially decreases the potential for catastrophic flooding for downstream communities. Flooding impacts the District when it damages access roads, increases sediment loads into the reservoir, and causes debris flows. This puts enormous pressure on the Twitchell Dam to protect life and property downstream.

On February 23, 1998, severe flooding throughout the Cuyama River Basin resulted in damage to agricultural land and roads; a record flood peak of 26,200 cubic feet per second (cfs) occurred



at approximately midnight at the U.S. Geological Survey (USGS) stream-gaging station on the Cuyama River below Buckhorn Canyon, near the City of Santa Maria (see Table 5-3). In response, the USGS, in cooperation with the Santa Barbara County Flood Control District and Water Agency, conducted a study to assess the magnitude and frequency (i.e., exceedance probability) of the flood, the distribution of tributary flood peaks in the basin, and factors that contributed to flooding. Continuous flow data has been collected at the Cuyama River below Buckhorn Canyon since October 1959; the previous record peak, at 17,800 cfs, occurred on February 25, 1969.

A storm event between December 17-23, 2010, brought approximately 280 percent of the normal countrywide rainfall, primarily located in the north county, especially Santa Maria and Sisquoc. The storm caused flooding, mudflows, and debris flows. Total individual assistance from FEMA was approximately \$1.9 million, and total public assistance was \$75.4 million. In early 2017, Governor Jerry Brown requested major disaster declarations for three severe winter storms that caused flooding and mudslides in January and February, affecting San Luis Obispo and Santa Barbara counties. The flooding increased water levels at the Twitchell Reservoir.

**Table 5-3. SMVWCD Historic Floods**

Year	Name of Disaster	Details
1998	Cuyama River Basin flooding	Flooding of the Cuyama River resulted in a washout of State Route (SR) 166
2010	North County Severe Storm	Severe storms caused flooding, mudflows, and debris flows.
2017	FEMA-4301-DR Severe Winter Storms, Flooding, and Mudslides	President declared Major Disaster 01/03/2017
2017	FEMA-4305-DR Severe Winter Storms, Flooding, and Mudslides	President declared Major Disaster 01/18/2017
2017	FEMA-4308-DR Severe Winter Storms, Flooding, and Mudslides	President declared Major Disaster 02/8/2017

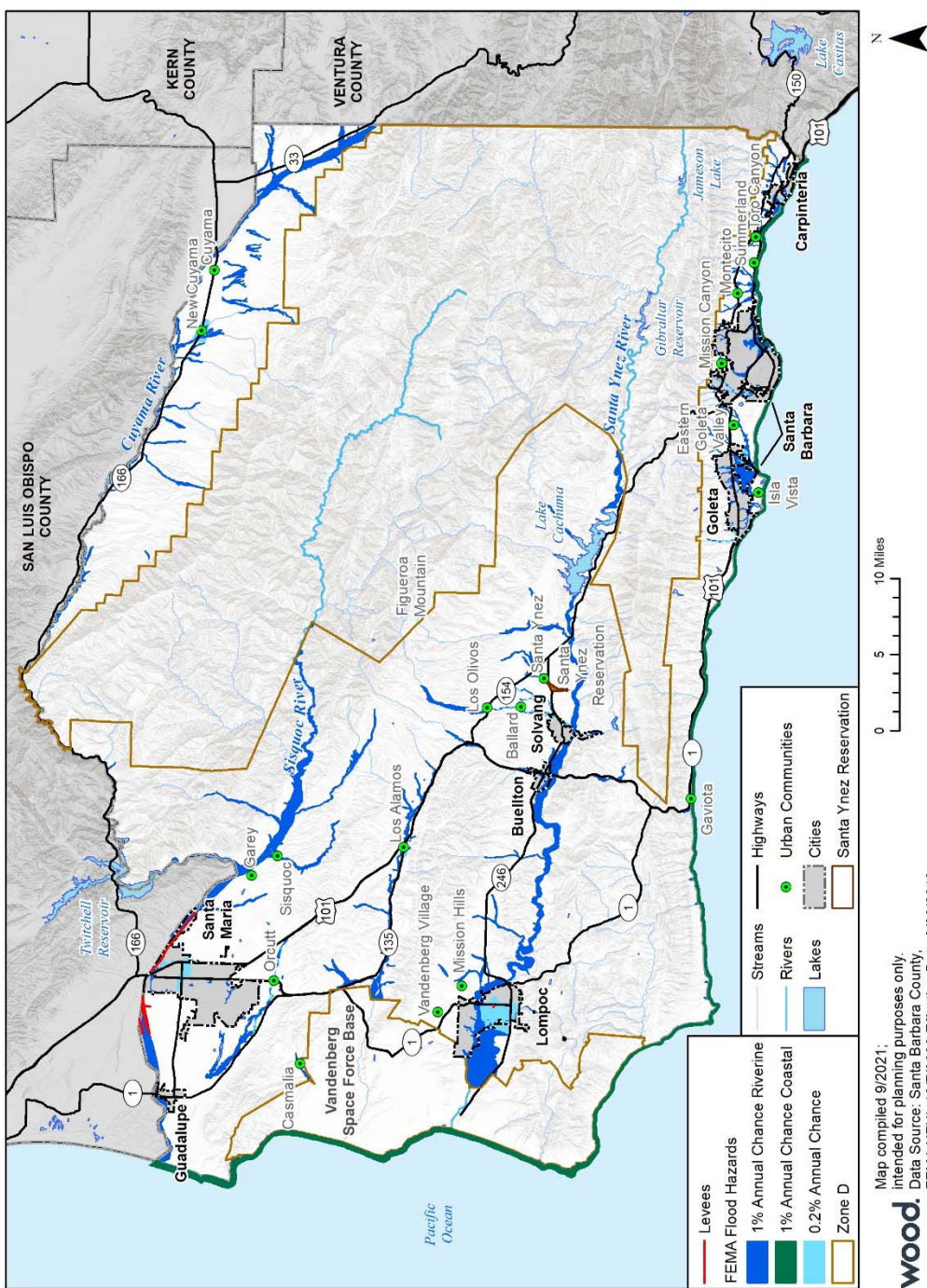
Scientists project that climate change will increase the frequency and intensity of heavy rainstorms that cause inland flooding. Climate change is projected to amplify existing flood hazards through increased frequency and strength of El Niño events and rainfall intensity. Extreme weather events have become more frequent over the past 40 to 50 years and this trend is projected to continue. Up to half of California's precipitation comes from a relatively small number of intense winter storms, which are expected to become more intense with climate change. The frequency and intensity of heavy rainstorms are projected to increase, causing fluvial flooding along the county's creeks and rivers, although overall annual precipitation levels are expected to increase only slightly.

#### **Repetitive Loss Information and NFIP Participation**

As a Special District, the SMVWCD is not eligible to participate in the NFIP and thus does not have any NFIP repetitive loss properties. Instead, please refer to the 2022 MJHMP.



Figure 5-1. Santa Barbara County FEMA Flood Hazard Areas



### 5.3.3 Dam/Levee Failure

A dam is a barrier that obstructs or directs the flow of water creating a lake or reservoir. The barrier may be made of earth, concrete, wood, or other material. A dam may fail for a variety of reasons including poor construction techniques, poor maintenance, age, earthquakes and landslides, extreme water inflow, and overtopping and sabotage. The resulting failure of the dam may result in rapid reservoir de-watering and downstream flooding with the potential for loss of life and property.

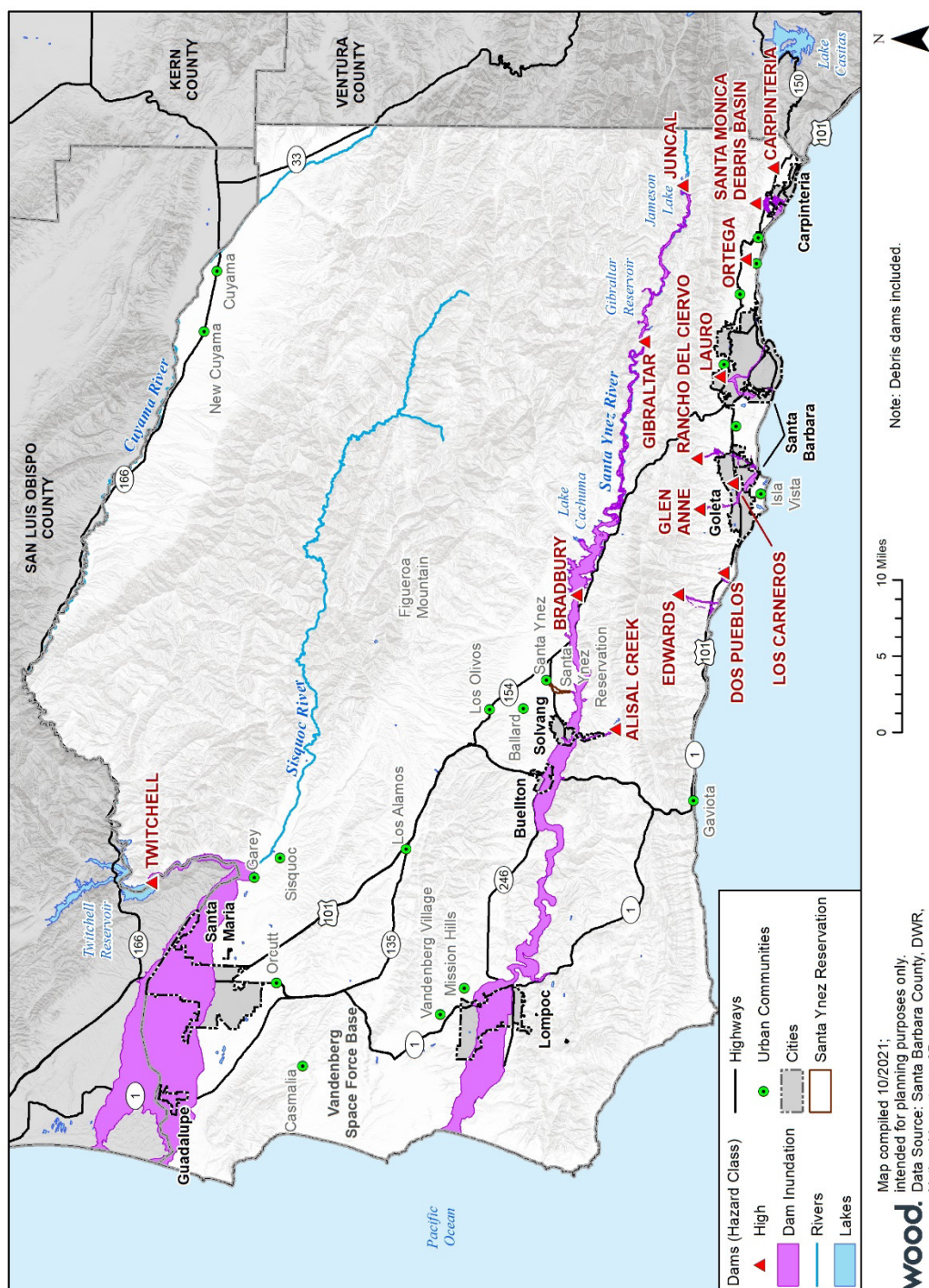
Dam failure can result from several natural or manmade causes. Structural failure caused by seismic activity can cause inundation by the action of a seismically induced wave, which overtops the dam without causing dam failure. This action is referred to as a seiche. Flooding as a result of a dam or levee failure could cause loss of life, property damage, and other ensuing hazards, as well as the displacement of persons residing in the inundation path. Damage to electric generating facilities and transmission lines could also impact life support systems in communities outside the immediate hazard areas. Property adjacent to and in the water flow area as identified by the Twitchell Dam inundation maps must be evacuated during a levee or dam failure.

A Safety Evaluation of Existing Dams (SEED) report released in 1983 contained seismotectonic studies which suggested that Twitchell Dam is in an area of potential seismic activity. It is located near “blind thrust” faults capable of quakes of 7.0 magnitude or more. Since this report was released, the dam has been seismically reinforced so that the safety and classification grade of the dam is satisfactory.

In the context of the District, dam failure would mean the Twitchell Dam releasing water downstream, or damage to the structural integrity of the reservoir (Figure 5-2). Although Twitchell Dam has never failed, such an event would cause catastrophic damage to life and property. While the City of Santa Maria has river levees, these structures would likely fail if faced with dam failure flood flows. The City of Guadalupe is unprotected by levees or other structures, leaving the commercial, residential, agricultural, and open space properties within this area at risk of flooding should there be a failure of the Twitchell Dam.

The potential for climate change to affect the likelihood of dam failure is not fully understood at this point. There is potential for increased precipitation events as a result of climate change conditions to present a future increased risk of dam failure if large inflows to reservoirs occur. However, this could be offset by generally lower reservoir levels if storage water resources become more limited or stretched in the future due to climate change, drought, and/or population growth.

Figure 5-2. Santa Barbara County Dam Inundation Hazard Areas





### 5.3.4 Wildfire

Wildfire is a severe threat to the District because wildfires remove crucial vegetation, exposing the Twitchell watershed area to erosion, particularly after storms, and increasing sediment loads in the reservoir. The majority of wildfires are caused by humans or lightning; however, once burning, wildfire behavior is based on three primary factors: fuel, topography, and weather. Fuel will affect the potential size and behavior of a wildfire depending on the amount present, its burning qualities (e.g., level of moisture), and its horizontal and vertical continuity. Topography affects the movement of air, and thus the fire, over the ground surface. The terrain can also change the speed at which the fire travels, and the ability of firefighters to reach and extinguish the fire.

In 2009, the La Brea fire burned 89,489 acres, 15 percent of which was within the Twitchell watershed. Models showed the erosion potential to be 29,193 cubic yards, with a sediment yield to Twitchell of 4,833 cubic yards per square mile, representing a 1,787-percent sediment yield increase (Table 5-4).

In 2017, the Alamo Fire burn area reached the edge of Twitchell Reservoir and encompassed the majority of the reservoir's perimeter, including the downstream side of the earthen dam. Portions of the access road and fences were damaged, and the watershed was severely compromised.

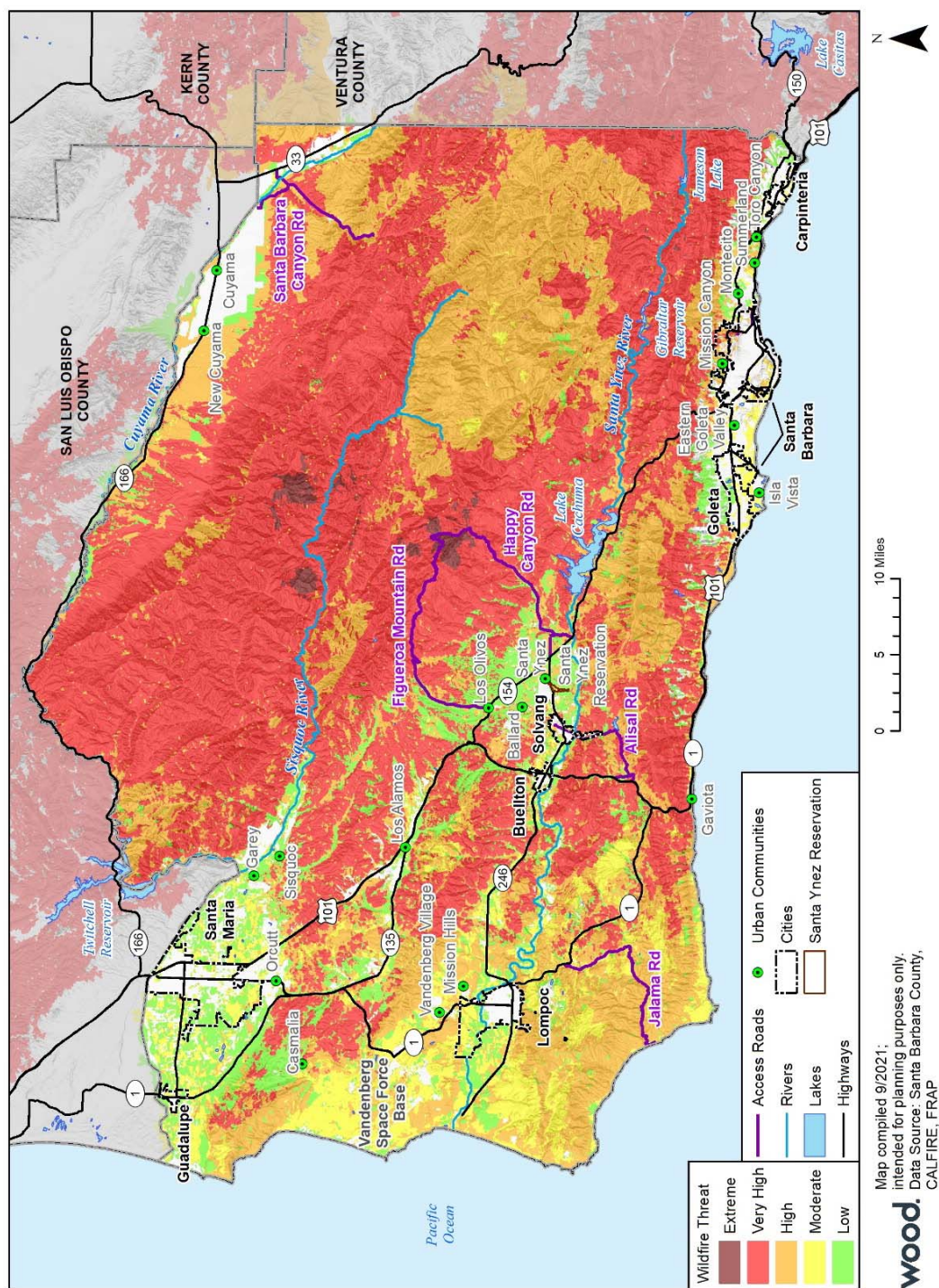
**Table 5-4. SMVWCD Historic Wildfires**

Year	Name of Disaster	Details
2009	La Brea Fire	89,489 acres burned around Twitchell Reservoir
2017	Thomas Fire	Burned Los Padres National Forest, sediment and debris flows followed
2017	Alamo Fire	28,687 acres, burned-out Twitchell Dam, 2018 Montecito debris flows followed

Wildfires are likely to impact the District again. Vegetation and topography are significant elements in the identification of the fire threat zones, as well as areas subject to high winds such as sundowners. As the Twitchell Reservoir is surrounded by mountainous and rural areas, supporting chaparral vegetation, a shrubland habitat of dense and scrubby brush that has evolved to persist in a fire-prone habitat. Chamise, manzanita, and ceanothus are types of chaparral that grow well in the area. These plants evolved and adapted to wildfire regimes and as they age and die, they require fire to regenerate. This cycle of fire-growth-death-fire will continue for the foreseeable future. This means that fire hazards will continue, although with changing probability depending on the stage of the cycle.

Climate change will affect the probability and severity of wildfire in the District. Increased average temperature and a continued Mediterranean climate mean increased vegetation drying, thereby contributing to greater fuel volumes. Increased usage of fossil fuels for transportation and electricity, along with increased deforestation has led to the overloading of the atmosphere with greenhouse gases such as carbon dioxide. These heat-trapping emissions act as a blanket and increase the overall atmospheric temperature, thus warming the planet. As summers get hotter and longer, the conditions for wildfires increase exponentially. Wildfires in the U.S. have been on an increasing trend and the effects of climate change have been shown to aggravate the frequency and duration of wildfires.

Figure 5-3. Wildfire Threat in Santa Barbara County



## 6.0 VULNERABILITY ASSESSMENT

The purpose of this section is to estimate the potential vulnerability (impacts) of hazards within the District on the built environment (District assets, regional communities, etc.) and population. This assessment informs the development of mitigation strategies to avoid or lessen potential impacts through the 2022 LHMP update. To accomplish this assessment, a qualitative estimate of the impacts of the priority hazards to the District is outlined below. Additionally, an assessment of District assets that may be vulnerable to these hazards is provided as well. A further description of the threats and methodologies used in this analysis is provided in Chapter 6.0, *Vulnerability Assessment* of the MJHMP. Refer to the LHMPs for the City of Guadalupe and the City of Santa Maria for an expanded description of vulnerabilities in each jurisdiction (Annexes D and G, respectively).

### 6.1 DESCRIPTION OF VULNERABILITIES

#### 6.1.1 Sediment Flows & Flood

Much attention by the District is paid to the issue of sediment management and flooding, as these are the overarching issues that threaten the very function of the Twitchell Dam. The two hazards are linked as flooding brings about sediment flows and sediment deposits into the Twitchell Reservoir.

According to the 2019 Twitchell Project Manual, the overall capacity of the reservoir has continued to decrease due to sedimentation (i.e., the buildup of sediment in the reservoir reduces capacity). In 2002, the SMVWCD contracted with Madonna Construction to remove sediment around the Outlet Structure on the upstream side of the Dam. The debris racks were also cleaned, repaired, and painted. In 2019, a permitting effort was underway to remove additional sediment downstream of the Dam by cleaning the stilling basin and creating a pilot channel along the creek alignment for up to 3,000 feet downstream. This effort was relayed by the Covid-19 Pandemic with remedial maintenance of the channel being completed by staff pending finalization of these permits and construction. This was not considered a critical or urgent project. The total sediment now in the reservoir below the spillway (651.5 feet elevation) is 42,357 acre-feet, which is a reduction of storage in the original (1958) capacity of 26.3 percent (Table 6-1). The 2000 survey and analysis showed a total of 41,774 acre-feet of sediment in the reservoir. The 2007 survey shows an increase of 583 acre-feet of sediment since 2000 or a 1.4-percent increase. In some areas of the lower reservoir sediment levels have raised as much as 11 feet. In areas of the upper reservoir, some channels have been cut by as much as 20 feet. The 40,000 acre-feet of storage allocated to sedimentation have been depleted.

Table 6-1 below shows the capacity of the reservoir at each survey year.

**Table 6-1. SMVWCD Twitchell Reservoir Capacity**

Year	Capacity at Elevation 651.5 Crest of Spillway	Capacity as Percent of Design	Accumulation of Silt at Elev. 651.5 (Acre-Feet)
1958	240,113	100.0%	-0-
1981	224,399	93.5%	15,714
1997	203,499	84.8%	36,614
2000	198,339	82.6%	41,774

Year	Capacity at Elevation 651.5 Crest of Spillway	Capacity as Percent of Design	Accumulation of Silt at Elev. 651.5 (Acre-Feet)
2007	197,756	82.4%	42,357

Sediment flows have a high probability of occurrence and could cause significant impacts on District operations. The shrinking capacity of the reservoir demonstrates the risks that flooding and debris flows pose to the District. If the reservoir loses capacity, it is less capable of holding excess rainfall and runoff from the Cuyama watershed. Therefore, the reservoir could overflow during a high-intensity rain event and the Santa Maria Valley may experience flood and sediment flows. The decreased capacity of the reservoir and increased pressure on the dam could also result in dam failure and subsequent levee failure (see Section 6.1.2, *Dam/Levee Failure*).

After wildfire has burned all plant life, the potential for severe damage from flooding and sediment flows after rain must be averted where possible. The rudimentary sediment transport analysis that was conducted in 1958-59 when the dam was designed did not anticipate the extensive sediment loading that would result following the very large and numerous wildfires that have occurred. A burned watershed can yield 4 to 10 times the volume of water that otherwise would be generated, and over 1,000 times the sediment. There has been no large-scale government revegetation effort in burned areas in the watershed, so Twitchell Dam and reservoir remain vulnerable to ongoing sedimentation at higher rates than planned. This ongoing sedimentation creates increased potential to exacerbate local and regional flooding vulnerabilities, particularly to downstream communities in Santa Maria and Guadalupe. Refer to the LHMPs for the City of Guadalupe and the City of Santa Maria for a description of flood vulnerabilities in each jurisdiction (Annexes D and G, respectively).

### 6.1.2 Dam/Levee Failure

Failure of Twitchell Dam would inundate portions of the cities of Santa Maria and Guadalupe and surrounding unincorporated areas, as well as Highway 1, with relatively little evacuation time. If the Twitchell Dam and levee system on the Santa Maria River failed, 1,957 properties in Guadalupe (with a total value of \$522,007,177) and 17,620 properties in Santa Maria (with a total value of \$7,965,233,663) are vulnerable to the catastrophic flooding that would occur. Approximately 7,243 residents in Guadalupe and 61,303 in Santa Maria within the inundation zone may need to be evacuated, cared for, and possibly permanently relocated. Additional unincorporated areas and communities would be affected by the failure of the Twitchell Dam and Santa Maria River levees as well. Refer to the LHMPs for the City of Guadalupe and City of Santa Maria for a description of dam/levee failure vulnerabilities in each jurisdiction (Annexes D and G, respectively).

Further, as listed in Table 6-2, 115 critical facilities would be vulnerable to damage or destruction from flooding due to dam and levee failure, including 17 facilities in Guadalupe, 88 facilities in Santa Maria, and 10 bridges in the unincorporated area. (see also, Section 6.6.3, *Dam Failure* and Section 6.6.8, *Levee Failure* of the MJHMP). Critical facilities that could be damaged by failure at Twitchell Dam have a total known value of \$60,680,184.



**Table 6-2. Critical Facilities Vulnerable to Inundation from Twitchell Dam Failure**

Type	Name	Total Building Value
<b>City of Guadalupe</b>		
Communications	Guad AC	-
Utilities	Pioneer St. Sewer Lift Station	\$2,500,000
Utilities	Laguardia St. Sewer Lift Station	\$2,500,000
Wastewater Treatment Plant	Wastewater Plant	\$25,000,000
Water Tank	Pioneer St Water Tank	\$5,000,000
Water Tank	Obispo St. Water Tank & Equipment	\$5,000,000
RMP Facilities*	Apio Cooling	-
RMP Facilities	Puritan Ice Company	-
Clinic	Marian Community Health Clinic- Guadalupe	-
Clinic	Community Health Centers of The Central Coast- Guadalupe	-
EMS Station	Guadalupe Fire Department Station 2	-
EMS Station	Guadalupe Fire Department Station 1	-
Senior Center	Guadalupe Senior Citizens Center	\$2,500,000
Education	Mary Buren Elementary	-
Education	Kermit McKenzie Junior High	-
Education	Guadalupe Preschool	-
Police	Guadalupe Police Department	-
<b>City of Santa Maria</b>		
Cellular Tower	Santa Barbara Cellular Systems, Ltd.	-
Power Plant	Santa Maria Cogen Plant	-
Power Plant	Santa Maria LFG Power Plant	-
Power Plant	J&A-Santa Maria II LLC	-
RMP Facilities	Gold Coast Packing Inc	-
RMP Facilities	California Giant	-
RMP Facilities	NH3 Service Company	-
RMP Facilities	Bonita Packing Refrigeration Facility	-
RMP Facilities	Lineage Logistics - Santa Maria	-
RMP Facilities	Santa Maria Rail Terminal	-
RMP Facilities	Froz-Sun Foods, Inc.	-
Clinic	Santa Maria Care Center	-
Clinic	Community Health Centers of The Central Coast- Santa Maria II	-
Clinic	Marian Community Health Clinic- Santa Maria	-
Clinic	Community Health Centers of The Central Coast- Santa Maria III	-
Clinic	Villa Maria Health Care Center	-
Clinic	Country Oaks Care Center	-
Clinic	Central Coast Kidney Disease	-



## 6.0. Vulnerability Assessment

Type	Name	Total Building Value
Clinic	Marian Medical Center	-
Clinic	PhD Santa Maria Women's Health	-
Clinic	Marian Extended Care	-
EMS Station	Santa Maria Fire Department Station 1	-
EMS Station	Santa Maria Fire Department Station 2	-
EMS Station	Santa Maria Fire Department Station 3	-
EMS Station	American Medical Response Station 9	-
Nursing Home	Villa Maria Healthcare Center	-
Nursing Home	Merrill Gardens At Santa Maria	-
Nursing Home	Country Oaks Care Center	-
Nursing Home	Marian Regional Medical Center DP/SNF	-
Nursing Home	Santa Maria Terrace	-
Nursing Home	Santa Maria Care Center	-
College Police	Allan Hancock College Police Department	-
Colleges / Universities	Allan Hancock College	-
Colleges / Universities	CET-Santa Maria	-
Colleges / Universities	Santa Barbara Business College-Santa Maria	-
Court	Santa Maria Court Complex Supreme Court/DA Building G	\$8,513,522
Court	Santa Maria Court Complex Superior Court Building C	\$2,087,988
Court	Santa Maria Court Complex Courthouse Building D	\$1,969,694
Court	Santa Maria Court Complex Pub. Defend Building A	\$1,506,759
Court	Santa Maria Court Complex Court Clerks Building E	\$693,256
Court	Santa Maria Court Complex Superior Court Building H	\$654,776
Court	Santa Maria Court Complex Jury Assy Building F	\$456,197
Court	Santa Maria Court Complex Supreme Court /DA Building	-
Education	Jimenez Roberto And Dr. Francisco Elementary School	-
Bridge	Multiple bridges over U.S. Highway 101, Bradley Channel, Santa Maria River, Blosser Channel, Sisquoc River, State Route 1	-
RMP Facilities	Frontier Cooling, Inc.	-
RMP Facilities	The Pictsweet Co - Santa Maria Plant	-
Education	Bonita Elementary	-
<b>Unincorporated Area</b>		
Bridge - Non Scour Fair Condition	Bridge	-
Bridge - Non Scour Fair Condition	Bridge	-
Bridge - Non Scour Fair Condition	Bridge	-
Bridge - Non Scour Good Condition	Bridge	-

Type	Name	Total Building Value
Bridge - Non Scour Poor Condition	Bridge	-
Bridge - Scour Poor Condition	Bridge	-
Bridge - Non Scour Fair Condition	Bridge	-
Bridge - Non Scour Fair Condition	Bridge	-
Bridge - Non Scour Fair Condition	Bridge	-
Bridge - Non Scour Fair Condition	Bridge	-

Notes: RMP Facilities = Risk Management Plan facilities

### 6.1.3 Wildfire

Wildfire has the potential to severely damage District facilities and affect District operations. The Twitchell Reservoir is surrounded by rural natural areas and has been burned by wildfire in the past. Wildfires create opportunities for sediment flows if burned areas are not revegetated after burns.

Fire Hazard Severity Zones are areas of significant fire hazards based on fuels (vegetation), terrain, weather, and other relevant factors. These zones define the application of various mitigation strategies to reduce the risk associated with wildland fires. The Twitchell Reservoir and other District facilities nearby are surrounded by high and very high fire hazard severity zones. Downstream of the reservoir in the District boundaries, the cities of Guadalupe and Santa Maria have less fire risk and are in non-wildland/non-urban and urban fire hazard severity zones. The District falls into a mix of State and Local Fire Responsibility Areas, with the cities located in local responsibility areas and the reservoir and surrounding areas located in state responsibility areas.

## 6.2 SMVWCD ASSETS & LOSS ESTIMATE

The loss estimate began with a review of the District's asset inventory. The Asset Inventory Summary includes key district facilities that may be vulnerable to SMVWCD priority hazards (Table 6-3).

**Table 6-3. SMVWCD Asset Inventory**

Type	Name	TOTAL
Structures	SMVWCD Administration Property (Residential and Office at the Dam)	\$400,000
Domestic Water Infrastructure	Water Control Systems (well, and drinking water treatment)	\$200,000
Dam	Twitchell Dam (including Outlet Works and Elevator House/shaft)	\$850,000,000

Type	Name	TOTAL
Water Storage	Twitchell Reservoir (domestic fresh water and fire water storage)	\$100,000
Equipment	Machinery and Equipment	\$250,000 - 300,000
<b>Total Asset Value</b>		<b>\$850,950,000</b>

District staff reviewed each asset category and assigned a potential percentage of damage expected due to each identified hazard. In addition, if there were identified reservoir or dam loss of function, values were also included. Table 6-4 identifies each asset category, name, total value, and the percent damage/damage value for each asset. The damages for each asset are totaled for each hazard to obtain the overall loss estimate for each hazard.

**Table 6-4. SMVWCD Vulnerability Assessment Calculations**

			Sediment Flow & Flooding		Dam/ Levee Failure		Wildfire	
Type	Name	TOTAL (x 1000)	% Damage	\$ Loss Estimate (x1000)	% Damage	\$ Loss Estimate (x1000)	% Damage	\$ Loss Estimate (x 1000)
Structures	SMVWCD Administration Property	\$400	25%	\$100	100%	\$400	50%	\$200
Domestic Water System Infrastructure	Water Control Systems	\$200	25%	\$50	100%	\$200	75%	\$150
Dam	Twitchell Dam	\$850,000	3%	\$25,500	100%	\$850,000	.01%	\$850
Water Storage	Twitchell Reservoir	\$100	0%	\$0	100%	\$100	90%	\$90
Equipment	Machinery and Equipment	\$250	25%	\$10	100%	\$250	50%	\$125
<b>Total</b>		<b>\$850,950</b>		<b>\$25,560</b>		<b>\$850,950</b>		<b>\$1,415</b>

## 7.0 MITIGATION STRATEGY

This section contains the District's updated and most current mitigation strategy as of 2022.

### 7.1 MITIGATION GOALS AND OBJECTIVES

The District's LPT accepted and agreed to the following goals and objectives for the 2022 update. These goals and objectives represent a vision of long-term hazard reduction or enhancement of capabilities. In preparation for the 2022 LHMP update, the District's LPT made no revisions to the countywide goals and objectives because they continue to reflect the needs of the District; see also, Chapter 7.0, *Mitigation Plan* of the 2022 MJHMP.

The updated goals and objectives of this plan are:

**Goal 1: Ensure future development is resilient to known hazards.**

**Objective 1.A:** Ensure development in known hazardous areas is limited or incorporates hazard-resistant design based on applicable plans, development standards, regulations, and programs.

**Objective 1.B:** Educate developers and decision-makers on design and construction techniques to minimize damage from hazards.

**Goal 2: Protect people and community assets from hazards, including critical facilities, infrastructure, water, and public facilities.**

**Objective 2.A:** Enhance the ability of community assets, particularly critical facilities, to withstand hazards.

**Objective 2.B:** Use the best available science and technology to better protect life and property.

**Objective 2.C:** Upgrade and replace aging critical facilities and infrastructure.

**Objective 2.D:** Ensure mitigation actions encompass vulnerable and disadvantaged communities to promote social equity.

**Goal 3: Actively promote understanding, support, and funding for hazard mitigation by participating agencies and the public.**

**Objective 3.A:** Engage, inform, and educate the public on tools and resources to improve community resilience to hazards, reduce vulnerability, and increase awareness and support of hazard mitigation activities.

**Objective 3.B:** Ensure effective outreach and communications to vulnerable and disadvantaged communities.

**Objective 3.C:** Increase awareness and encourage the incorporation of hazard mitigation principles and practice among public, private, and nonprofit sectors, including all participating agencies.

**Objective 3.D:** Ensure interagency coordination and joint partnerships with the County, cities, state, tribal, and federal governments.

**Objective 3.E:** Continuously improve the County's capability and efficiency at administering pre- and post-disaster mitigation programs, including providing technical support to cities and special districts and providing support for implementing local mitigation plans.

**Objective 3.F:** Monitor and publicize the effectiveness of mitigation actions implemented countywide.

**Objective 3.G:** Position the County and participating agencies to apply for and receive grant funding from FEMA and other sources.

**Goal 4: Minimize the risks to life and property associated with urban and human-caused hazards.**

**Objective 4.A:** Minimize risks from biological hazards, including disease, invasive species, and agricultural pests.

**Objective 4.B:** Be prepared and respond to urban hazards, including terrorism, cyber threats, and civil disturbance.

**Objective 4.C:** Minimize risks from energy production, including hazardous oil and gas activities.

**Goal 5: Prepare for, adapt to, and recover from, the impacts of climate change and ensure regional resiliency.**

**Objective 5.A:** Use the best available climate science to implement hazard mitigation strategies in response to climate change.

**Objective 5.B:** Identify, assess, and prepare for impacts of climate change.

**Objective 5.C:** Coordinate with the public, private, and nonprofit sectors to implement strategies to address regional hazards exacerbated by climate change.

**Objective 5.D:** Ensure climate change hazard mitigation addresses vulnerable and disadvantaged communities.

## 7.2 MITIGATION PROGRESS

As this is the first LHMP for the District, Section 7.4, *Implementation Plan* establishes the mitigation actions for the District. Future updates to this LHMP will include a review of mitigation progress and reporting.

## 7.3 MITIGATION APPROACH

A simplified Benefit-Cost Review was applied to 2022 mitigation actions to prioritize the mitigation recommendations for implementation. The priority for implementing mitigation recommendations depends upon the overall cost-effectiveness of the recommendation when considering monetary and non-monetary costs and benefits associated with each action. Additionally, the following questions were considered when developing the Benefit-Cost Review:

- How many people will benefit from the action?
- How large an area is impacted?
- How critical are the facilities that benefit from the action?
- Environmentally, does it make sense to do this project for the overall community?

Section 7.4, *Implementation Plan* provides a benefit-cost review for each mitigation recommendation, as well as a relative priority rank (High, Medium, and Low) based upon the judgment of the District's LPT. The general category guidelines are listed below:

- High – Benefits are perceived to exceed costs without further study or evaluation
- Medium – Benefits are perceived to exceed costs but may require further study or evaluation before implementation

- Low – Benefits and costs evaluation requires additional evaluation before implementation

Discussion of the rationale for these priorities is included in the mitigation action descriptions below.

## 7.4 IMPLEMENTATION PLAN

### 2022-1. Cuyama Hydrology Study

The 2020 Twitchell Project Manual recommends that a detailed study of the hydrology and sediment transportation characteristics of the Cuyama watershed be studied to focus efforts on the best opportunities for sediment control. This study should include:

1. A look at each sub-basin with its tributaries to determine soil types, creek gradients, hydrology, and sediment generating potential.
2. A look at the historic fire burn areas and sediment generating potential.
3. Prioritization of sub-basins by sediment generating potential.
4. A detailed look at access availability for projects on the high-priority tributary systems.
5. Feasibility and cost analysis for easement purchases, project environmental impacts, and costs.
6. Consideration of suitable locations for in-river, or off-river sedimentation basins.
7. Updates as needed due to changes in river characteristics, climate change, etc.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	2 years
Estimated Cost/Funding Source	\$220,000/ Grants, District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify sediment control measures upstream, benefiting the District immensely. As sources and causes of sediment are better understood and addressed upstream, costs of dealing with it in the basin will radically be reduced.
Comments	Caltrans realignment of HWY 126 and lack of upstream reforestation after wildfires are important causes to study as well.

### 2022-2. Current Hydraulic and Sediment Transport Analysis

Previous studies show a trend in the inflow of sediment, but recent fires have removed the natural upstream soil protection benefit of vegetation in the burn areas. A detailed study of the hydrology and sediment transport within the upstream watershed sub-basins and the Cuyama River itself should be prepared to estimate the rate and quantity of sediment to the Twitchell Reservoir.

This information will help establish the priority of projects and motivate the development of an informed schedule for implementation.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	2 year
Estimated Cost/Funding Source	\$100,000/Grants, District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify sediment control measures upstream, benefiting the District immensely. As sources and causes of sediment are better understood and addressed upstream, costs of dealing with it in the basin will radically be reduced.
Comments	Caltrans realignment of HWY 126 and lack of upstream reforestation after wildfires are important causes to study as well.

### 2022-3. Upstream Project Analysis

Additional study and analysis will be needed to determine the feasibility and cost of:

- Upstream Sedimentation Basins
- Revegetation
- “Single Treatment Watercourse Improvements”
- The Effect of Mining Operations Upstream

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	2-5 years
Estimated Cost/Funding Source	\$120,000/ Grants, District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify sediment control measures upstream, benefiting the District immensely. As sources and causes of sediment are better understood and addressed upstream, costs of dealing with it in the basin will radically be reduced.
Comments	Caltrans realignment of HWY 126 and lack of upstream reforestation after wildfires are important causes to study as well.

### 2022-4. Outlet Works Flushing Procedure Development Analysis

Currently, the District performs a sequence of “fast releases” to clear the outlet works of sediment at the upstream intake structure. This procedure, along with occasional excavation and removal of sediment upstream of the intake structure has been beneficial in keeping the intake structure open.

An analysis to consider modifying the flushing operation to reduce the potential for impacting the tunnel, and downstream Cuyama River with excessive sedimentation below the dam is suggested. Annual cleaning of the tunnel and Stilling Basin combined with larger flushing releases may reduce

the frequency of sediment removal required in the downstream Cuyama River, which is a very expensive process due to permitting issues.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	3-5 years
Estimated Cost/Funding Source	\$100,000/ District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify sediment impacts down the line, but if understood and used prudently, could be one tool to maintain the outlet works open and functional, benefiting the District immensely.
Comments	This procedure development will require multiple seasons of incremental implementation to determine when it can be used and when it is not advisable to be used

#### 2022-5. Downstream HEC RAS Release Inundation Study

For various release rates, perhaps 500 cfs, 1500 cfs, 2500 cfs, and 5,000 cfs, determine the flood plain elevation for the Cuyama River from Twitchell Dam to the Santa Maria River. This data is needed to make well-informed decisions on flushing operations in the future. This study should consider impacts on downstream farming and determine agency obligations for damage if any.

Also, there is currently channel constriction downstream of the dam due to vegetation on private property. This condition has reduced the estimated capacity of the open channel in the river to around 300 cfs or damage will occur to vineyards. The County of Santa Barbara Flood Control and Water Conservation District has performed environmental work to assist in the maintenance of this channel.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	2-3 years
Estimated Cost/Funding Source	\$175,000/ Grants, District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify sediment impacts down the line, but if understood and used prudently, could be one tool to maintain the outlet works open and functional, benefiting the District immensely.
Comments	

#### 2022-6. Further Feasibility Study of Sediment Removal Alternatives

Alternatives considered in the 2000 URS Greiner Sediment Management Plan need additional engineering level detail in light of current knowledge and experience. Feasibility needs to be reviewed given our understanding of the potential negative impacts of a large movement of



sediment to the Santa Maria River. Alternative sediment stockpile sites should be considered. More detailed project descriptions of preferred alternatives from the sediment management plan could be used for future grant submittals.

Develop a plan for sediment disposal, with development of potential lease agreements, for deposition of removed sediments.

Having “shovel ready” permits and specifications for dredging and sediment removal and deposition would be highly beneficial to on-going future dam operations.

The Dunes Center Estuary Improvement and Enhancement Plan should be considered in this study.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	2-7 years
Estimated Cost/Funding Source	\$500,000/ Grants, District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify sediment control measures down the line, benefiting the District immensely.
Comments	Having “shovel ready” permits and specifications for dredging and sediment removal and deposition would be highly beneficial to on-going future dam operations.

### 2022-7. Access Road Maintenance Study

The access road to Twitchell Dam was originally a chip seal road intended for maintenance access only and had no significant structural section. With the numerous recent sediment management projects performed involving heavy equipment accessing the Dam area, the road has deteriorated extensively. The 4.5-mile road needs complete reconstruction, not only localized repair. The cost to reclaim and overlay the road is estimated at \$2.6 million. Currently, the strategy is to perform this over 5 or ten years with a supplementary annual pothole project to keep the remaining areas intact. A study to refine a strategy would be simple, inexpensive, and warranted.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	5 – 10 years
Estimated Cost/Funding Source	\$2.6 million/ Grants, District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify sediment control measures down the line, benefiting the District immensely.
Comments	

### 2022-8. Enhancement of Groundwater Recharge

The amount of groundwater pumped for municipal water supply in the SMVMA in 2020 was as low as in the 1970s, likely due to water importation and recent conservation efforts. Projects to augment groundwater recharge could alleviate groundwater level declines in the SMVMA in the short and long term.

Sedimentation issues have severely hampered and reduced water conservation releases for groundwater recharge in the Santa Maria Aquifer. Mitigating sedimentation issues will restore and enhance groundwater recharge.

With the existing groundwater and surface, water quality degradation in the SMVMA, the implementation or expansion of certain water resource management approaches could reduce the contribution of salts, nutrients, and other constituents of concern to groundwater and surface water. Examples could include:

- Agricultural landowners and operators implementing water quality monitoring and management programs that reduce agricultural runoff, constituent loading to surface waters, and salt loading to groundwater in the SMVMA;
- Nearby Laguna Community Services District typically provides a small amount of treated water for industrial or commercial uses, effectively recycling water that, in turn, reduces groundwater pumping by that amount, and
- The SMVWCD, in collaboration with other partners, has completed studies and plans to conduct a stream infiltration enhancement project along portions of the Santa Maria River. Completion of the project would facilitate increased stream recharge to the aquifer and improved groundwater quality.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	1 – 3 years
Estimated Cost/Funding Source	\$150,000/ Grants, District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify groundwater recharge down the line, benefiting the District immensely.
Comments	

### 2022-9. Expansion of the SMVMA Monitoring Program

It is crucial that collaborative groundwater level monitoring be continued. The USGS well subset should be evaluated for improvement after April measurements such as to replace or add wells as needed. A USGS well subset for groundwater quality sampling should be developed and implemented as early as summer/fall 2021, including addressing areal and vertical well coverage for water quality sampling. Stream discharge gauging should be implemented at Cuyama River, Sisquoc River, and Santa Maria River. Installation of or development of access to at least one

shallow well east of Orcutt and one deep well northwest of the City of Santa Maria should be included in the monitoring program.

Mitigation Priority and Performance	
Priority	Medium
Hazards Mitigated	Dam/Levee Failure, Flood, Sediment Flow, Wildfire
Estimated Timeline	1-5 years
Estimated Cost/Funding Source	\$150,000/ Grants, District or TMA
Responsible Agency/Department	SMVWCD/County Water Agency/Twitchell Management Agency
Cost-Benefit Consideration	Cost Beneficial – While a study could cost money for planning, it would help identify groundwater recharge down the line, benefiting the District immensely.
Comments	

## 8.0 PLAN MAINTENANCE

### 8.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

As this LHMP is the District's first, the LPT will begin monitoring, evaluating, and updating the plan upon adoption on a continuing and as-needed basis. The District will continue to participate in the countywide MAC and attend the annual meeting organized by the County OEM to discuss items to be updated/added in future revisions of this plan. The MJHMP is evaluated by the MAC annually to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. This includes re-evaluation of goals, objectives, and mitigation actions for each jurisdiction by the MAC. The MAC also reviews the goals and mitigation actions to determine their relevance to changing situations in the county, as well as changes in State or Federal regulations and policy. The MAC reviews the risk assessment portion of the MJHMP and its annexes to determine if this information should be updated or modified, given any new available data. The responsible parties for the mitigation actions report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised. Any updates or changes necessary for the District's LHMP will be forwarded to the County Office of Emergency Management for inclusion in further updates to the MJHMP.

Major disasters affecting SMVWCD, legal changes, notices from Santa Barbara County OEM (lead agency for the MJHMP), and other significant events may trigger revisions to this plan or the convening of the LPT. The District LPT, in collaboration with the Santa Barbara County OEM, and the other communities of the County, will determine how often and when the plan should be updated.

To remain eligible for mitigation grant funding from FEMA, the District is committed to revising the plan at a minimum of every five years. The District's designee will contact the county four years after this plan is approved to ensure that the county plans to undertake the plan update process. The jurisdictions within Santa Barbara County should continue to work together on updating this multi-jurisdictional plan.

## 8.2 IMPLEMENTATION THROUGH EXISTING PLANS AND PROGRAMS

The District implements the LHMP through existing plans, programs, and procedures, as detailed in Section 4.0, *Capability Assessment*. This LHMP provides a baseline of information on the hazards impacting the City and the existing institutions, plans, policies and ordinances that help to implement the LHMP (e.g., infrastructure improvement plan, drought preparedness and water storage plan, conservation programs). The LHMP complements these plans and programs, working together to achieve the goal of reducing risk exposure to the District's customers and assets. An update to the District's operating documents may trigger an update to the hazard mitigation plan. Implementation responsibilities of mitigation actions is integrated into the operational functions of the responsibility parties identified, including responsibility for seeking funding needed for implementation. The LHMP has also been prepared to support the District's infrastructure planning and funding to implement infrastructure improvements to reduce dam, earthquake, drought, and flooding hazards and improve District resilience to climate change.

The information contained within this LHMP, including results from the Vulnerability Assessment and the Mitigation Strategy, is used by the District to help inform updates and the development of plans, programs, and policies. The District may utilize the hazard information when developing and implementing the infrastructure improvement programs and coordinating with other agencies on implementation of improvements.

## 8.3 ONGOING PUBLIC OUTREACH AND ENGAGEMENT

The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Before the adoption of updates, the District will provide the opportunity for the public to comment on the updates. A public notice will be published before the meeting to announce the comment period and meeting logistics. Moreover, the District will engage stakeholders in community emergency planning. As described in Section 3.4, *Public Outreach and Engagement*, the public outreach strategy used during development of the current update will provide a framework for public engagement through the plan maintenance process. It can be adapted for ongoing public outreach as determined to be feasible by the MAC and the LPT.

## 8.4 POINT OF CONTACT

Comments or suggestions regarding this plan may be submitted at any time to Keith Haddick, District Board President, or Casey Conrad, Board Member and Committee Chairman, District Technical Advisory Committee, using the following information:

Keith Haddick, President, Board of Directors  
Santa Maria Valley Water Conservation District  
2250 South Broadway Avenue, Suite #8  
Santa Maria, CA 93454  
khaddick@smvwcd.org  
805-925-5212

Casey Conrad, Board Member and Committee Chairman, District Technical Advisory Committee  
Santa Maria Valley Water Conservation District  
2250 South Broadway Avenue, Suite #8  
Santa Maria, CA 93454  
cconrad@smvwcd.org  
805-925-5212

## 9.0 REFERENCES

- Twitchell Management Authority & MNS Engineers Inc. 2020. Twitchell Project Manual. Accessed on: February 19, 2022.
- Santa Maria Valley Water Conservation District & MNS Engineers Inc. 2019. Twitchell Reservoir Results of 2018 Aerial Survey & Sedimentation Update. Accessed on: February 19, 2022.
- Luhdorff and Scalmanini, Consulting Engineers. 2020. 2020 Annual Report of Hydrogeologic Conditions Water Requirements, Supplies, and Disposition, Santa Maria Valley Management Area. Accessed on: February 19, 2022.